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THE NORTH AMERICAN ANTS OF THE GENUS
CAMPONOTUS MAYR

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Our North American *Camponoti*, which comprise not only our largest and most conspicuous, but also many of our most abundant ants, were admirably revised in 1893 by Prof. Carlo Emery¹ on the basis of a rather extensive collection received from Mr. Theo. Pergande. So much new material, however, has come to light within the past seventeen years, that it seems advisable again to take account of stock. Emery recorded 28 forms of *Camponotus* from America north of Mexico. These represent 11 species, 9 subspecies and 12 varieties. The present paper records from the same territory 58 forms, representing 21 species, 17 subspecies and 27 varieties. Most of the new forms have been found in western and southwestern Texas and southern Arizona and properly belong to the fauna of northern Mexico. Careful search will undoubtedly bring to light several additional forms in the southwestern states and possibly also in tropical Florida, but I believe that few new forms remain to be discovered in other parts of the Union. I have seen all the recorded forms except two varieties of *C. fallax* (var. *cnemidatus* Emery and var. *paucipilis* Emery), and I have observed most of the species, subspecies and varieties in living colonies.

Ethologically, our *Camponoti* may be divided into two sections, one of which, embracing only the *maculatus* group, contains species that nest in the ground under stones or logs or more rarely in obscure crater nests, whereas the other section embraces all the other groups and contains species that usually nest in dead wood or oak galls. These wood-inhabiting species, however, exhibit considerable diversity of habit.

No genus of ants has a more interesting or significant geographical distribution than *Camponotus*. In North America, only one of the

¹ Beiträge zur Kenntniss der nordamerikanischen Ameisenfauna. Zool. Jahrb. Abth. f. Syst. VII, pp. 633-682, Taf. 22. 1893.

species ranges over Alaska, British America and the United States, viz: the circumpolar *C. herculeanus*, and of this the variety *whymperi*, which is almost indistinguishable from the north European and Alpine type and is said by Emery to be identical with the Siberian variety, is practically confined to Alaska, British America and to higher elevations in the United States. The variety *noveboracensis* extends across the continent through the northern states and Canada at low elevations; the subspecies *pennsylvanicus* occurs apparently only in the United States and Canada east of the one hundredth meridian and at ordinary elevations, the variety *modoc* only west of the same meridian at higher altitudes. The varieties *mahican* and *ferrugineus* seem to be confined to the northeastern and middle western states. Another species of wide range is the circumpolar *C. fallax*, which is represented by at least 12 subspecies and varieties in the United States and southernmost British America. All the remaining species are decidedly local. The various subspecies and varieties of the *maculatus* group are confined to the western and southern states, the subspecies of *maculatus* occurring only west of the one hundredth meridian, except in Texas, where one of the forms (*sansabeanus*) is found at least as far east as Austin, and in Florida, where there is a subspecies (*tortuganus*) of tropical origin. The southwestern states have a few peculiar species of the *maculatus* group, in all probability of Mexican provenience. These are *C. fumidus*, *vafer* and *acutirostris*. A tropical species of this group, *C. socius*, is known to occur only in southern Florida, and two members of the *maculatus* group, which are peculiar to North America, viz: *C. castaneus* and its subspecies *americanus*, are confined to the region east of the one hundredth meridian and south of British America. In this region, *americanus* ranges farther north than *castaneus*. A single very constant species of the *herculeanus* group, *C. lavigatus*, is confined to rather high elevations in the Rocky Mts., Coast, Cascade and Sierra Nevada Ranges. The *fallax* group is represented in Arizona and Texas by a few large and handsome species, *C. sayi*, *texanus* and *schaefferi*, and in California by a small and somewhat aberrant species, *C. hyatti*, with the variety *bakeri*. *C. mina*, subsp. *zuni*, *C. brucei* and *ulcerosus* are properly Mexican forms of rare and sporadic occurrence in Texas and Arizona. Two tropical species, *C. planatus* and *abdominalis*, enter the United States at two widely separated points, from the West Indies at the tip of Florida and from the "tierra caliente" of Mexico at the mouth of the Rio Grande. *C. planatus* is the same in both these regions, but *abdominalis* is represented by a distinct subspecies (*floridanus*) in Florida and a Mexican subspecies (*transvectus*) in Texas. The species of the subgenus *Colobopsis* seem to be confined to the Gulf

States and the Mississippi Valley, but, as these ants form small colonies and live very secluded lives, their exact distribution cannot be determined at the present time. All four of the forms enumerated in this paper have been taken in Texas. I have seen a single worker minor, which seemed to belong to *C. pylartes*, from southern Illinois.

In the following pages, I have given descriptions of all the forms, except those of the *fallax* and *Colobopsis* groups, which have been described in detail in two papers already published.² As our knowledge of the precise distribution of our North American *Camponoti* has been very vague and incomplete heretofore, I may be pardoned for citing all the localities from which I have seen specimens, together with the names of correspondents who have most generously assisted me in collecting material.

The following table will facilitate the identification of the major (maxima) workers.³

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|---|----|
| 1. Head of worker major truncated anteriorly; truncated surface circular; intermediate forms (mediæ) between largest and smallest workers lacking or extremely rare. (A) Subgenus <i>Colobopsis</i> | 54 |
| Head of worker major not, or at most very obliquely, truncated anteriorly; truncated surface not circular; intermediates nearly always present. (B) Subgenus <i>Camponotus</i> | 2 |
| 2. Head rectangular, as broad in front as behind, obliquely truncated in front; each cheek with an irregular longitudinal impression bordered laterally by a crenate ridge.....(53) | |
| <i>ulcerosus</i> sp. nov. | |
| Head always somewhat narrower in front than behind; cheeks without a longitudinal impression and ridge..... | 3 |
| 3. Anterior median clypeal margin, with a distinct but narrow notch. Anterior clypeal margin entire, or at most feebly and broadly excised or sinuate in the middle..... | 38 |
| 4. Clypeus carinate | 5 |
| Clypeus ecarinate, or with a very feeble or blunt carina..... | 27 |
| 5. Small species, not more than 6-7 mm. long..... | 37 |
| Large species, averaging more than 8 mm..... | 6 |
| 6. Anterior clypeal border produced as an angular lobe, with a sharp point in the middle..... | 7 |
| Anterior clypeal border more or less produced as a broad truncated lobe, with rounded or angular lateral corners and straight or feebly excised or sinuate median margin..... | 8 |

² "The American Ants of the Subgenus *Colobopsis*," Bull. Amer. Mus. Nat. Hist., XX, pp. 139-158, 7 figs., 1904; and "The North American Forms of *Camponotus fallax* Nylander," Journ. N. Y. Ent. Soc., XVIII, No. 4, 1910.

³ The numbers in parentheses preceding the names of the species, subspecies and varieties refer to the descriptions in the text.

7. Tibiæ brown. Length, 12-13 mm. (18) *acutirostris* sp. nov.
 Tibiæ black. Length, 15 mm. (19) *acutirostris prinipilaris*
 subsp. nov.
8. Middle and hind tibiæ with a row of graduated bristles on the
 flexor surface 9
 Middle and hind tibiæ without such bristles. 21
9. Antennal scapes flattened at the base; tibiæ usually not black. . . . 10
 Antennal scapes not flattened at the base; tibiæ black. (12)
maculatus ocreatus Emery.
10. Surface of gaster opaque. 11
 Surface of gaster shining. 14
11. Posterior corners of head without yellow spots; thorax dark red
 or black 12
 Posterior corners of head, with yellow spots; thorax yellowish
 red. (3) *maculatus vicinus* var. *luteangulus* var. nov.
12. Head ferruginous red; base of gaster, with golden yellow bands.
 (20) *socius* Roger.
 Head black; gaster black, or black with red basal segments. 13
13. Thorax brownish red or chestnut; gaster often red at the base.
 (1) *maculatus vicinus* Mayr.
 Thorax, with black pro- and mesonotum; gaster not red at base.
 (2) *maculatus vicinus* var. *plorabilis* var. nov.
14. Antennal scapes not only flattened but slightly lobulate at the
 base 15
 Antennal scapes not lobulate at the base. 16
15. Length, 10-13 mm.; head brown in front, black behind; thorax.
 legs, petiole and at least the base of the gaster light brown or
 brownish yellow. (8) *maculatus maccooki* Forel.
 Length, 9-11 mm.; black; petiole and base of gaster slightly red-
 dish. (11) *maculatus bulimosus* subsp. nov.
16. Thorax black like the head and gaster. . . . (F) *maculatus vicinus*
 var. *infernalis* var. nov.
 Thorax red or brownish yellow. 17
17. Thorax red 18
 Thorax brownish yellow. 19
18. Length, 11-13 mm.; gaster often red at the base. . . (5) *maculatus*
vicinus var. *nitidiventris* Emery.
 Length, 8-10 mm.; gaster entirely black. . . (6) *maculatus vicinus*
 var. *maritimus* var. nov.
19. Apical half of gaster infuscated. (9) *maculatus sansabeanus*
 Buckley. 20
 Whole gaster yellow.
20. Head brown or reddish. . . (4) *maculatus vicinus* var. *scimitestaccus*
 Emery.
 Head black. (10) *maculatus sansabeanus* var. *torrefactus*
 var. nov.
21. Antennal scapes not flattened at the base; tibiæ without long
 oblique hairs 22

- Antennal scapes flattened at the base; tibiae with long oblique hairs 26
22. Head, thorax and petiole subopaque, ferruginous brown; scapes without short, erect hairs.. (13) *maculatus tortuganus* Emery.
Thorax shining, wholly or in part clay yellow; scapes with short, erect hairs 23
23. Mandibles 7-toothed. Length, 8-10 mm..... 24
Mandibles 5- to 6-toothed. Length, 12-14 mm. (17) *vafer* sp. nov.
24. Head pale yellow, not infuscated behind..... (15) *fumidus* var. *fragilis* Pergande.
Head brownish, vertex of head infuscated or black..... 25
25. Occipital border of head yellow or brown..... (14) *fumidus* var. *festinatus* Buckley.
Whole dorsal surface of head dark brown or black..... (16) *fumidus* var. *spureus* var. nov.
26. Head entirely ferruginous red; cheeks with small foveolæ, without erect hairs..... (23) *abdominalis floridanus* Buckley.
Vertex of head dark brown or black, cheeks with deep, elongated foveolæ and erect hairs..... (24) *abdominalis transvectus* sub. sp. nov.
27. Small species, not more than 6 mm. long; head rugose in front. (52) *bruesi* sp. nov.
Large species, at least 8-9 mm. long; head never rugose in front.. 28
28. Antennal scapes, with short erect hairs, body shining, black.. (25) *lævigatus* Smith.
Antennal scapes without erect hairs..... 29
29. Head small (3.2 x 2.8 mm.); body shining; mandibles 6- to 7-toothed 30
Head large (3.4 x 3.4 mm.); the head and thorax at least opaque or subopaque; mandibles 5-toothed..... 31
30. Body entirely yellow or reddish yellow..... (21) *castaneus* Latr.
The head at least dark brown or black..... (22) *castaneus americanus* Mayr.
31. Gaster opaque or subopaque..... 32
Gaster shining 36
32. Pubescence on gaster short..... 33
Pubescence on gaster very long..... 35
33. Sculpture coarse; hairs and pubescence golden yellow..... 34
Sculpture finer; hairs and pubescence pale yellow or white.. (29) *herculeanus pennsylvanicus* var. *mahican* var. nov.
34. Posterior portion of thorax red.. (26) *herculeanus* var. *whymperi* Forel.
Whole thorax black..... (27) *herculeanus* var. *modoc* var. nov.
35. Thorax, petiole, gaster and usually also the legs black; pubescence pale yellow or white..... (28) *herculeanus pennsylvanicus* De Geer.
Posterior portion of thorax, petiole, legs and base of gaster reddish yellow; pubescence and pilosity golden yellow..... (30) *herculeanus pennsylvanicus* var. *ferrugineus* Fabricius.

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|---|--|
| 36. Gaster black in female and worker..(31) <i>herculeanus ligniperda</i> var. <i>novboracensis</i> Fitch. Gaster deep red in female.....(32) <i>herculeanus ligniperda</i> var. <i>rubens</i> Wheeler. | |
| 37. Thorax marginate on the sides and behind; head and thorax fer- ruginous red.....(51) <i>planatus</i> Roger. Thorax not marginate; head and thorax black....(50) <i>mina zuni</i> subsp. nov. | |
| 38. Large species, averaging 10–11 mm.; middle and hind tibiæ with bristles on their flexor surfaces..... 39 Small species, averaging 6–8 mm.; middle and hind tibiæ without bristles on their flexor surfaces..... 40 | |
| 39. Entirely yellowish red; clypeal notch rather shallow.....(47) <i>schæfferi</i> Wheeler. Head black, thorax and legs red; gaster black, with first segment yellow at the base.....(46) <i>texanus</i> Wheeler. | |
| 40. Thorax, with a distinct impression at the mesoëpinotal suture... 41 Thorax without a distinct impression at the mesoëpinotal suture. 42 | |
| 41. Gaster entirely black or dark brown.....(48) <i>hyatti</i> Emery. Basal two-thirds of first gastric segment red....(49) <i>hyatti</i> var. <i>bakeri</i> Wheeler. | |
| 42. Head large, very broad, excised behind; gaster very shining, with- out pubescence. Length, 8 mm.....(45) <i>sayi</i> Emery. Head smaller, narrower; gaster pubescent, less shining; length usually less than 8 mm..... 43 | |
| 43. Cheeks and clypeus with elongate, piligerous foveolæ..... 50 Cheeks and clypeus without such foveolæ..... 44 | |
| 44. Body black, thorax at most only partially red; average length, 6.5 mm.....(33) <i>fallax</i> var. <i>nearcticus</i> Emery. Of a different color..... 45 | |
| 45. Both head and thorax reddish brown or yellowish red..... 48 Head largely dark brown or black..... 46 | |
| 46. Average length, 5.5 mm..... 47 Average length, 7 mm.; base of gaster banded with yellow..(36) <i>fallax</i> var. <i>tanquaryi</i> Wheeler. | |
| 47. Thorax dark red, head and gaster black.....(34) <i>fallax</i> var. <i>minutus</i> Emery. Thorax ivory yellow, spotted with brown, base of gaster often banded with yellow.....(35) <i>fallax</i> var. <i>pardus</i> Wheeler. | |
| 48. Average length, 6–6.5 mm..... 49 Average length, 8 mm.....(38) <i>fallax rasilis</i> Wheeler. | |
| 49. Gaster yellow at the base.....(39) <i>fallax rasilis</i> var. <i>pavidus</i> Wheeler. Gaster black throughout.....(37) <i>fallax</i> var. <i>decipiens</i> Emery. | |
| 50. Piligerous foveolæ few on the cheeks, usually absent on the clypeus 51 Both cheeks and clypeus with numerous piligerous foveolæ..... 52 | |
| 51. Yellowish brown, gaster paler, with brown bands....(40) <i>fallax</i> <i>subbarbatus</i> Emery. | |

- Brownish black... (41) *fallax subbarbatus* var. *paucipilis* Emery.
52. Head blackish brown..... 53
 Head and thorax yellowish red..... (42) *fallax discolor* Emery.
53. Thorax blackish.... (44) *fallax discolor* var. *enemidatus* Emery.
 Thorax red..... (43) *fallax discolor* var. *clarithorax* Emery.
54. Thorax feebly and evenly arcuate above, without a distinct impression at the mesoëpinal suture; border of truncated surface of head sharp.... (54) *abditus* var. *etiolutus* Wheeler.
 Thorax, with a distinct impression at the mesoëpinal suture; border of truncated surface of head blunt..... 55
55. Gaster entirely black..... (55) *impressus* Roger.
 Gaster banded with yellow at the base..... 56
56. Thorax and posterior portion of head dark brown.. (56) *pylartes* Wheeler.
 Head and thorax yellow..... (57) *pylartes* var. *hunteri* var. nov.

A. SUBGENUS CAMPONOTUS

I. *Maculatus* Group1. *Camponotus maculatus vicinus* Mayr

Camponotus vicinus MAYR, Verh. zool. bot. Ges. Wien, XX, p. 940, ♂, 1870; FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, p. 60, ♂, 1879; DALLA TORRE, Catalog. Hymen., VII, p. 257, 1893.

C. sylvaticus var. *vicinus* MAYR, Verh. zool. bot. Ges. Wien, XXXVI, p. 422, 1886.

C. maculatus subsp. *vicinus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 671, ♂ ♀, 1893; FOREL, Biol. Centr. Amer., p. 131, 1899-1900.

Worker major. Length, 11-13 mm.; head, 3.7 x 3.5 mm.; scape, 3.2 mm.; hind tibia, 3.3 mm.

Head, excluding the mandibles, nearly as broad as long, broader behind than in front, with feebly concave posterior and feebly convex lateral borders, convex dorsal and flattened gular surfaces. Mandibles strong, convex, 6-7-toothed. Clypeus carinate, its anterior border moderately produced in the form of a broad flap-like lobe with rounded corners and crenate edge. Frontal carinae lyrate. Eyes moderately large, flattened. Antennal scapes distinctly flattened at the base and but slightly widened at their tips, which reach a short distance beyond the posterior corners of the head. Thorax robust in front though narrower than the head; pro- and mesonotum slightly flattened; meso- and metapleural regions compressed; in profile, the dorsum is evenly arched, the epinotum with subequal base and declivity, forming at their juncture a rounded, obtuse angle. Petiole with convex anterior and flattened posterior surface and rather blunt border. Gaster of the usual shape. Legs long; middle and hind tibiae elliptical in cross-section, neither compressed nor grooved.

Mandibles and anterior borders of cheeks shining, the former very coarsely striato-punctate; head, thorax and gaster subopaque; head densely shagreened

behind, in front very densely and finely punctate or granular, sides also with numerous small rounded foveolæ; sides of clypeus and inner borders of frontal carinæ with a few large piligerous foveolæ. Thorax, petiole and legs more finely, gaster more coarsely and transversely shagreened, also with small transverse foveolæ bearing the pubescence and large piligerous foveolæ across the middle and along the posterior border of each segment.

Hairs and pubescence yellow, the former long, sparse and erect, confined to the mandibles, clypeus, dorsal surface of head, thorax, border of petiole, gula and both dorsal and ventral surfaces of the gaster. Pubescence sparse, especially on the gaster, but very distinct on the posterior portions of the head, thoracic dorsum, scapes and legs. Middle and hind tibiæ with rows of stiff, graduated bristles on their flexor surfaces. There are a few short hairs at the tips of the antennal scapes and at the femoro-tibial articulations.

Head and antennal scapes black; mandibles, clypeus, cheeks and antennal funiculi often tinged with red. Thorax and legs brownish red or chestnut; gaster black, with dull brown posterior segmental margins; base of first segment or the whole of the first and second segments red like the thorax.

Worker minor. Length, 7-8.5 mm.

Head longer than broad, not contracted but rounded behind the eyes, with rather straight, subparallel sides. Clypeus and antennal scapes much like those of the worker major, the scapes reaching nearly half their length beyond the posterior corners of the head. Thorax about as broad as the head, base of the epinotum somewhat longer than the declivity. Petiole subcuneate, with more convex posterior surface and blunter border than in the worker major.

Sculpture, pilosity and color much as in the worker major, but gaster not red at the base.

Female. Length, 14-16 mm.

Head similar to that of the worker major but proportionally longer and narrower behind, with more nearly parallel sides. Thorax about as broad as the head. Epinotum with short, convex base and much longer, steep and slightly concave declivity. Petiole rather high, thick below, compressed anteroposteriorly above, with sharp border. Wings long (16-17 mm.).

Differs from the worker major in sculpture to the extent of having the thorax, gaster, legs and lower lateral borders of the head shining.

Pilosity, pubescence and color much as in the worker major, but the mesonotum, scutellum and metanotum black and the pronotum, pleuræ, tibiæ and femora sometimes infuscated. Gaster frequently red at the base. In some specimens, the whole of the thorax and the legs are very dark brown or black. Wings suffused with brown; veins and stigma light brown.

Male. Length, 8-11 mm.

Head somewhat longer than broad, with large, convex eyes, broader and rounded postocular region and concave cheeks. Clypeus carinate, with broadly rounded anterior border. Mandibles edentate. Antennal scapes slender, terete, not flattened at the base. Thorax robust; epinotum like that of the female. Petiole very low and thick, its upper border transverse, blunt, sometimes with a broad but shallow excision.

Head, thorax and gaster very finely shagreened, shining.

Pilosity much as in the worker; pubescence shorter and much less conspicuous.

Black; mouthparts, funiculi, genitalia, tarsi and articulations of the legs and wings brownish or reddish. Wings colored like those of the female.

This, the typical form of the subspecies *vicinus*, as defined by Emery, is represented in my collection by specimens from the following localities:

California: Alameda, Harris, Humboldt County and Felton, Santa Cruz Mts. (J. C. Bradley); San Jacinto Mts., 6000 ft. (F. Grinnell, Jr.); Mt. Lowe (5000 ft.) and Palmer's Canyon, near Claremont (Wheeler).

Nevada: King's Canyon, Ormsby County (C. F. Baker).

Oregon: Corvallis (Amer. Mus. Nat. Hist.).

Washington: Seattle and Almoda (A. L. Melander); Friday Harbor (T. Kincaid); Grand Coulee; Pullman (W. M. Mann).

Idaho: Julietta and Moscow (J. M. Aldrich).

New Mexico: Mera Chaco Canyon (Pepper).

British America: Lardo, Kootenay Lake (J. C. Bradley).

Emery cites this form from Descanso, Calif. Mayr mentions it from Connecticut and Virginia, but this is evidently an error, probably traceable to incorrectly labeled specimens or to confounding the form with the very similarly colored *C. noveboracensis*.

C. vicinus and its varieties live in the soil under stones in rather dry, sunny places. The eggs and young larvæ are of a peculiar salmon-yellow color. The sexual phases seem to occur in the nests at all times of the year.

2. *C. maculatus vicinus* var. *plorabilis* var. nov.

Very similar to the typical *vicinus* in sculpture and pilosity, but differing in color. The thorax, petiole and legs of the worker forms are deep red, the pronotum and mesonotum of the worker major black, the gaster entirely black, except for the brown posterior segmental margins.

The female is decidedly smaller than that of the typical form (12-13 mm.) and black, with the exception of the antennal funiculi, pleuræ, declivity of epinotum and legs, which are dark red.

The male is indistinguishable from that of the typical form.

I have seen specimens of this variety from the following localities:

California: Pacific Grove (H. Heath).

Nevada: (Amer. Mus. Nat. Hist.).

Washington: Pullman, Kiona, San Juan Island and Ellensburg (W. M. Mann); Seattle.

Idaho: Moscow (J. M. Aldrich).

Apparently the small workers mentioned by Emery from Beckwith,

Calif. (5000 ft.) belong to this variety, which at first sight may be confounded with forms of *C. herculeanus* colored like the European type or like the American *C. whymperi*.

3. *C. maculatus vicinus* var. *luteangulus* var. nov.

Very similar to the typical *vicinus*, but the thorax of the major and minor workers is paler, of a more yellowish red color and all of the worker forms have a bright yellow spot on each of the posterior corners of the head. The gaster of the largest workers is more or less yellowish red at the base. The surface of the body is a little more shining than in *vicinus* but less so than in the var. *nitidiventris*. Males without varietal characters.

Described from several workers and males taken by C. R. Biederman in Carr Canyon, Huachuca Mts., Arizona, one worker from the Yakima River, Washington, taken by Samuel Henshaw, four workers taken by W. M. Mann on Moscow Mt., Idaho, and three workers from Wawawai, Washington, taken by the same collector.

4. *C. maculatus vicinus* var. *semitestaceus* Emery

EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 672. ♂, 1893.

Described by Emery from a couple of workers from Plummer County, Calif., 5000 ft. (Theo. Pergande), which had the thorax and legs reddish yellow, the head dark ferruginous red, the vertex, mandibles and antennal scapes piceous brown, the gaster clay yellow. Other specimens from Fuller's Mill, San Jacinto, Calif., were still paler, being entirely clay-yellow, with the head partly pale dirty brown. The cheeks bore a few very short bristles, the erect pilosity was more abundant than usual, especially on the gula.

There are in my collection a worker *media* and a minor from the San Jacinto Mts., Calif. (F. Grinnell, Jr.), referable to this variety. In the *media*, however, the head and antennal scapes are entirely black and opaque. The worker minor is red throughout, with the top of the head slightly darker.

5. *C. maculatus vicinus* var. *nitidiventris* Emery

EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 672. ♂, 1893.

Differing from the typical *vicinus* in the sculpture of the worker forms, the shagreening of the gaster and often also of the head and thorax being finer and more superficial, so that these parts are shining. The pubescence on the body is also shorter and much less conspicuous, especially on the gaster. There are no erect hairs on the cheeks. The thorax, legs and petiole are yellowish red; in major workers of most colonies, the gaster is black throughout, but in some, it is more or less red or yellowish red at the base. In some specimens which form a transition to the var. *luteangulus*, the posterior cor-

ners of the head are rather indistinctly reddish or yellowish. The female *nitidiventris* differs from that of *vicinus* in its more shining head. The male seems to lack varietal characters.

Of this variety, which is common in the western states, I have seen many specimens from the following localities:

Colorado: Salida, Boulder, Florissant, Buena Vista, Colorado City, Colorado Springs, Manitou (Wheeler); Steamboat Springs (T. D. A. Cockerell); Pueblo (Jerome Schmitt); Stout, Ft. Collins and Dixon Canyon (E. G. Titus).

Wyoming: Carbon County (Wortmann).

New Mexico: Romeroville, San Ignacio, Gallinas Canyon, Santa Fe, Raton, Pecos, Silver City, Dripping Spring in Organ Mts. and Las Vegas (T. D. A. Cockerell); Alamogordo (G. v. Krockow); Albuquerque (F. C. Pratt).

Arizona: Coconino Forest, Grand Canyon (Wheeler); Ramsey Canyon, Huachuca Mts. (W. M. Mann and Wheeler).

California: Santa Rosa; Marin County.

Emery cites this variety from Louisiana, but I believe that this must be an error, for, according to my observations, it does not descend, at least to the eastward, much below an altitude of 6000 feet, and is properly an ant of the high plains and slopes of the Rockies. The two California localities above mentioned are represented only by a couple of major workers and these may be rubbed specimens of the true *vicinus*.

6. *C. maculatus vicinus* var. *maritimus* var. nov.

Closely resembling the preceding variety, but of smaller size in all phases except the male. Length of worker major, 8-10 mm.; worker minor, 6-7 mm.; female, 11-12 mm. (wings 12 mm.); male, 9-10 mm. The gaster is entirely black in the worker major and female, or reddish only at the extreme base; the wings of the male are very pale. The female has the head, pro- and mesonotum, scutellum and metanotum black, the remainder of the thorax, the legs and petiole yellowish red, the mandibles, clypeus and antennæ dark red.

California: Pacific Grove and San José (H. Heath); Catalina Island (C. F. Baker).

7. *C. maculatus vicinus* var. *infernalis* var. nov.

This variety is based on several major and minor workers from Las Vegas, N. Mexico (Wheeler); a single worker media from Santa Cruz Mts., Calif. (J. C. Bradley) and three minor workers and two males from Palo Alto, Calif. (W. M. Mann). These all closely resemble the *nitidiventris* in sculpture, but the thorax is black like the head and

gaster, the lower pleuræ, the petiole, legs and funiculi dark brown. The clypeus, mandibles and scapes are black.

S. *C. maculatus maccooki* Forel

C. sylvaticus stirps *maccooki* FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, P. 81, p. 69, ♀ ♂, 1879; *Ibid.*, (2) XX, P. 91, p. 347, 1884.

C. maccooki DALLA TORRE, Catalog. Hymen., VII, p. 241, 1893.

C. maculatus subsp. *maccooki* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 672, Taf. XXII, Fig. 29, ♀, 1893.

Worker major. Length, 10-13 mm.; head, 3.2 x 3 mm.; scape, 2.7 mm.; hind tibia, 3.6 mm.

In structure closely resembling *C. vicinus*, but the antennal scapes are more thickened at their tips, and their bases are not only flattened but dilated to form a small but distinct, rounded lobe on the outer side. Mandibles 5- to 6-toothed. Base and declivity of epinotum subequal. Middle and hind tibiæ elliptical in cross-section, not sulcate.

Sculpture of body as in the var. *nitidiventris*, the sides of the head covered with punctures or small foveolæ as in that form.

Pilosity as in *vicinus*, but pubescence much less developed, being as short and inconspicuous as in *nitidiventris*. There are no hairs on the cheeks. Middle and hind tibiæ with bristly flexor surfaces.

Head, cheeks, clypeus, mandibles and antennæ deep reddish brown or ferruginous; front and vertex black, mouthparts yellowish. Thorax, legs, petiole and gaster sordid light brown or brownish yellow, the gaster usually more or less dark brown at the tip and often transversely banded with fuscous on the more anterior segments, rarely black throughout.

Worker minor. Length, 6-8 mm.

Resembling the worker major in sculpture, pilosity and color, but the head is more shining. The lobular dilation at the base of the antennal scape is small but perceptible.

Female. Length, 12-14 mm.

Resembling the female of *nitidiventris* in sculpture and pilosity; color like that of the major worker, but the mesonotum, scutellum and metanotum are dark brown, the pronotum more or less infuscated. In some specimens the whole gaster is brownish yellow and lighter than the pleuræ and legs; in others it is dark brown at the tip and obscurely transversely banded with brown more anteriorly. Wings suffused with brownish yellow; veins yellow, stigma brownish.

Male. Length, 9 mm.

Very similar to the male of *vicinus* and its varieties. The antennal scapes are flattened, dilated and lobulate at the base.

The types of this subspecies came from the Island of Guadalupe, about 200 miles off the west coast of Lower California. I have seen numerous

worker and female specimens but only a single male from the following places in the Pacific States:

California: Palo Alto (H. Heath and W. M. Mann); San José (H. Heath); Alameda and Marin County (Amer. Mus. Nat. Hist.); Ukiah, Mendocino County and Berkeley (J. C. Bradley); Point Loma, San Diego (P. Leonard); Pasadena (Wheeler).

Washington: (Osten Sacken).

Oregon: (Osten Sacken); Corvallis (Amer. Mus. Nat. Hist.).

Emery cites *maccooki* also from Descanso, Calif.

9. *C. maculatus sansabeanus* Buckley

Formica sansabeana BUCKLEY, Proc. Ent. Soc. Phila., VI, p. 167, ♀ ♀ ♂, 1866.

Camponotus marginatus var. *sansabeana* MAYR, Verh. zool. bot. Ges. Wien, XXXVI, p. 365, 1886; DALLA TORRE, Catalog. Hymen., VII, p. 242, 1893.

C. maculatus subsp. *maccooki* var. *sansabeanus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 672, ♀ ♀, 1893; WHEELER, Trans. Tex. Acad. Sci., IV, Pt. II, No. 2, p. 23, ♀ ♀ ♂, 1902.

Worker major. Length, 9-11 mm.; head, 2.8 x 2.7 mm.; scape, 2.5 mm.; hind tibia, 2.5 mm.

Resembling *maccooki* but stouter, more thick-set, with proportionally larger head and shorter legs. The flattened dilatation at the base of the antennal scape is broader than in *vicinus*, but slightly narrower and less lobulate than in *maccooki*. Clypeal carina blunter, lobe of the anterior border shorter.

Sculpture and pilosity as in *maccooki*, but lower surface of head with more numerous erect hairs. Cheeks with a very few erect hairs arising from somewhat elongated foveole. Pubescence very short and sparse.

Color much like that of *maccooki*, but thorax more brownish, basal half of gaster yellow or yellowish brown, apical half and sometimes the whole gaster more infuscated.

Worker minor. Length, 5-7 mm.

Antennal scapes less dilated at the base than in the worker minor of *maccooki*. Cheeks without erect hairs. Color much like that of the worker major.

Female. Length, 12-14 mm.

Head broader than in *maccooki*, especially behind. Surface, especially of the thorax and gaster, very smooth and shining. Pubescence more dilute and inconspicuous than in the worker major. Wings long (12-13 mm.), suffused with yellow; veins and stigma brownish yellow.

Male. Length, 8-9 mm.

Head proportionally shorter than in the male *maccooki*. Cheeks hairy. Antennal funiculi, tarsi and tibiae yellowish brown; wings less suffused with yellow and paler than in the female; veins and stigma pale yellow.

The types of this form were, in all probability, collected by Buckley in central Texas, where it is rather common, nesting under stones in dry woods. Emery's specimens also came from this region and from Louisiana. I have before me specimens from the following localities:

Texas: Austin, topotypes (Wheeler); Marble Falls (Wheeler); Handley (J. C. Crawford); Leary (W. D. Pierce).

New Mexico: Pecos (T. D. A. Cockerell and M. Grabham).

Arizona: Prescott (Wheeler).

Colorado: Manitou (Wheeler).

Although Emery records *sansabeanus* as a variety of *maccooki*, I believe that it should rank as an independent subspecies of *maculatus*, on account of its smaller size and the different proportions of the head, body and legs in the worker major.

10. *C. maculatus sansabeanus* var. *torrefactus* var. nov.

The worker major differs from that of *sansabeanus* in having the whole gaster brownish yellow, like the thorax, petiole and legs. The head is deep red, with the front and vertex black and the posterior corners each with a yellow spot; in the worker minor the head and antennæ are brown, the mandibles darker. The antennal scapes in all the workers are less dilated at the base than in the corresponding phases of *sansabeanus*. The male has the funiculi, tarsi and tibiæ paler, the pleuræ and often the thoracic dorsum and gaster piceous instead of black. The head is very broad, with shorter and less concave cheeks than in the preceding subspecies and varieties, and the anterior portion of the head is conspicuously hairy. The wings are scarcely suffused with yellow, the veins and stigma very pale. I have not seen the female.

Described from numerous workers and males from three colonies, two taken by myself in the Coconino Forest and Indian Garden, Grand Canyon, Arizona, the other by Mr. R. V. Chamberlin at East Mill Creek, Utah.

11. *C. maculatus bulimosus* subsp. nov.

Worker major. Length, 9–11 mm.; head, 3.2 x 3.2 mm.; scape, 2 mm.; hind tibia, 2.5 mm.

With the stature of *sansabeanus*, but differing in the following particulars: head proportionally larger, as broad as long, with the anterior angles larger and more inflated as in *C. herculeanus*, so that the mandibles appear to be more retracted. Clypeus even less produced, with the median border crenate and slightly pointed in the middle and the carina more distinct. Antennal scapes shorter and much more flattened and dilated at the base, with a small lobe as in *maccooki*, and nearly as broad at the tip as at the base. Thorax thickset, with high, rounded epinotum, the declivity being as long as the base.

Body subopaque; mandibles, legs and venter more shining; surface of head and thorax rather coarsely, gaster more finely and superficially shagreened. Whole head, including the clypeus and front, covered with small punctures.

which are more scattered on the posterior corners. Posterolateral borders of clypeus, inner borders of frontal carinae, the pro- and mesonotum with a few piligerous foveolæ.

Hairs much as in *sansabeanus*, even on the cheeks.

Black; thorax, petiole and base of gaster slightly reddish; insertions and tips of scapes, funiculi and legs deep reddish brown; posterior borders of gastric segments sordid yellowish.

Worker minor. Length, 5-7 mm.

Differing from the minor worker of *sansabeanus* in the shorter and broader head; with more prominent anterior corners, the shorter and basally more dilated antennal scapes.

Body more shining than in the worker major. Pilosity and color as in this phase, but mandibles, clypeus, cheeks and scapes deep red and legs sometimes more yellowish.

Female. Length, 13-15 mm.

Resembling the major worker, but head longer than broad and thorax and gaster more shining. Black; mandibles, funiculi, femora and tibiæ deep reddish brown; venter and sides of two basal gastric segments blotched with brownish yellow; trochanters and tips of coxæ of the same color. Wings strongly tinged with brown; veins and stigma pale brown.

Male. Length, 7-8 mm.

Resembling the male of *sansabeanus*, but the head and thorax somewhat more opaque. Hairs dirty yellow, rather abundant on the cheeks, which are somewhat broader in front than at the eyes. Black; funiculi and tarsi light brown. Wings somewhat paler than in the female.

Described from a number of specimens of all four phases from a single colony found by C. R. Biederman nesting in the ground under a stone at Palmerlee, Arizona, (5500 ft.) and several workers and males taken by W. M. Mann in Ramsey Canyon, Huachuca Mts., (5800 ft.) in the same territory.⁴

This form is readily distinguished by the shape of the head, short antennal scapes and the combination of the characters of the antennæ of *maccooki* with the thickset stature of *sansabeanus* and the coloration of the darkest forms of *vicinus*. It deserves a higher rank than as a mere variety of *sansabeanus*.

12. *C. maculatus ocreatus* Emery

C. maculatus subsp. *ocreatus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 673, ♀, 1893; *Ibid.*, VIII, p. 336, 1894.

C. maculatus race *ocreatus* PERGANDE, Proc. Calif. Acad. Sci., (2) IV, p. 26, ♀, 1893.

⁴ During November, 1910, I found this ant very common under stones in Miller Canyon, Huachuca Mts., Ariz., between 5000 and 6000 ft.

Worker major and media.

"Both in habitus and structure of the head and clypeus this subspecies bears the greatest resemblance to *maccooki* Forel, but differs from this form in its feebler sculpture; the whole head is therefore more shining in the worker major (hardly less shining than in the typical *castaneus*). The scattered punctures on the sides of the head are smaller and less numerous. *The antennal scape is more slender, longer and neither flattened nor dilated at the base.* The color of the three specimens before me (one major and two media workers) is clay-yellow; head, antennal scape, first funicular joint, knees, tibiae and first tarsal joint black, remainder of tarsi and funiculus brown; in the large worker the thorax is darker, pro- and mesonotum piceous brown; tip of gaster blackish. Epinotum, even in the large workers, with its basal surface nearly twice as long as the declivity; in this respect differing from the subsp. *maccooki* and *vicinus*, which have a much higher epinotum.

"Length of worker major, 12 mm.; head, 3.5 x 3.2 mm.; scape, 3.4 mm.; hind tibia, 4 mm.

"Panamint Mts., California, from Mr. Pergande." (Emery.)

Pergande records this form also from San Luis and San Esteban, Mexico.

I have not seen the worker forms, but I have before me five dealated specimens which I take to represent the female of this subspecies. Four of these are from Palmerlee, Arizona, 6000 ft., (C. R. Biederman) and one from the Huachuca Mts. in the same territory (Dr. H. Skinner). They vary from 14–16 mm. in length. The structure of the antennæ and the coloration of the legs and gaster are as described for the worker, the thorax is brown, with the pro-, meso- and metanotum and scutellum either entirely black or spotted with dark brown. The posterior portion of the head is subopaque and densely shagreened, the remainder of the body very smooth and shining. The clypeus is like that of *maccooki*, the lobe of the anterior border being very short, the carina distinct. There are several large punctures or foveolæ on the clypeus and also on the cheeks where they are somewhat elongated. Pilosity sparse, absent on the cheeks. Pubescence very short and dilute. The middle and hind tibiae are somewhat triangular in cross-section and grooved on their anterior surfaces, and the series of graduated bristles extends along nearly the whole length of their flexor surfaces.

13. *C. maculatus tortuganus* Emery

C. maculatus subsp. *tortuganus* EMERY, Zool. Jahrb. Abth. f. Syst., VIII. p. 336, ♂, 1894.

Worker major. Length, 9–11 mm.; head, 2.6 x 2.3 mm.; scape, 2.2 mm.; hind tibia, 2.8 mm.

Head rather long and narrow, with very feebly convex sides. Eyes large, moderately convex. Mandibles 7-toothed. Clypeus strongly carinate, the lobe

of its anterior border moderately produced, rather narrow, with very faintly sinuous median edge and rounded lateral corners. Frontal carinæ lyrate, rather closely approximated. Antennal scapes terete at the base, neither dilated nor flattened, enlarged towards their tips. Thorax slender, low, evenly arched above in profile; epinotum with the base fully twice as long as the declivity, which is slightly concave. Petiole rather high and narrow, with convex anterior and flattened posterior surface and blunt lateral and upper border. Legs rather long; middle and hind tibiæ triangular in cross-section, with sulcate anterior surface.

Head, thorax and petiole subopaque, very densely and finely shagreened. Mandibles shining, coarsely striato-punctate. Anterior border of cheeks and clypeus shining, cheeks and sides of head with small, elongate punctures or foveolæ; clypeus and inner borders of frontal carinæ, pro- and mesonotum with a few coarse piligerous punctures. Gaster finely and superficially shagreened, shining.

Hairs yellowish, erect, moderately abundant on the dorsal surface, very short and appressed on the antennal scapes and legs; femora with a few long hairs on their flexor surfaces; bristles lacking on the flexor surfaces of the tibiæ. Cheeks without erect hairs, those on the anterior border of the clypeus short and inconspicuous. Funiculi with very minute erect hairs. Pubescence very sparse, short on the head and thorax, somewhat longer on the gaster.

Ferruginous brown; head darker than the thorax, and the upper surface of the latter often darker than the pleuræ. Mandibles and anterior borders of cheeks and clypeus blackish. Scapes infuscated except at the base. Gaster black or dark brown, venter, base of first segment and posterior margins of segments paler. Coxæ and femora yellow, tibiæ and tarsi ferruginous.

Worker minor. Length, 6-7 mm.

Head very long, more than twice as long as broad, excluding the mandibles, somewhat narrowed behind in the occipital region; cheeks long, parallel. Clypeus like that of the worker major. Thorax very slender; base of epinotum more than three times as long as the declivity.

Head, thorax and petiole more shining than in the worker major, paler and more yellowish brown; head somewhat darker, mandibles brown. Gaster and legs colored as in the worker major. Pilosity also similar, but there are no minute erect hairs on the antennal funiculi. Cheeks without foveolæ or only with a few faint elongate punctures.

Female. Length of body, 10-11 mm.; of wings, 11 mm.

Resembling the worker major in sculpture, pilosity and color. Head proportionately longer. Eyes large and convex. Thorax as broad as the head, rather depressed; epinotum with indistinct base and declivity, the former fully as long as the latter. Petiole similar to that of the worker major. Wings suffused with sordid yellow; veins and stigma pale brownish yellow.

Male. Length, 7 mm.

Head through the eyes about as broad as long. Eyes and ocelli very large. Cheeks much shorter than the eyes, straight and parallel. Posterior portion of head broad and rounded. Clypeus subcarinate, with broadly rounded, pro-

jecting anterior border. Mandibles narrow, edentate. Antennæ slender, first funicular joint as long as the second, distinctly incrassated. Thorax robust, with low, evenly rounded epinotum; its base and declivity indistinctly differentiated, the former about twice as long as the latter. Petiole longer than high, with a low, thick, transverse node. Gaster and legs slender.

Head and thorax subopaque or somewhat shining, especially the pleuræ and the front of the head, very minutely and indistinctly shagreened; gaster shining.

Hairs yellow, erect, rather long and abundant on the head and gaster, petiole and epinotum, sparse on the remainder of the thorax. Legs and antennæ naked. Pubescence rather long on the gaster, but inconspicuous or absent elsewhere.

Head yellowish brown beneath and behind, with a large dark brown or black spot on the vertex. Antennæ, thorax, petiole and legs brown; gaster dark brown or blackish, with paler posterior margins to the segments; mouth-parts and genitalia yellowish. Wings dull whitish, with pale yellow veins and stigma.

Described from a long series of specimens of all four phases belonging to a single colony taken by myself at Miami, Florida. I have also taken this subspecies at Planter on Key Largo, and have specimens from Lake Worth (Jerome Schmitt) in the same State. Emery based the subspecies on a single worker from the Dry Tortugas. This he supposed to be a worker *media*, but it was undoubtedly a worker *major* (*maxima*), since this has a smaller head than our other *Camponoti* of the *maculatus* group. *C. tortuganus* is closely related to the subsp. *lucayanus* Wheeler from the Bahamas, to *C. vafer* and *C. fumidus* var. *festinatus*, but all of these forms have erect hairs on the antennal scapes.

14. *C. fumidus* Roger var. *festinatus* Buckley

Formica festinata BUCKLEY, Proc. Ent. Soc. Phila., VI, p. 164. ♂ ♀, 1866.

Camponotus festinatus DALLA TORRE, Catalog. Hymen., VII, p. 231. 1893.

C. fumidus var. *pubicornis* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 670, ♂, 1893.

C. fumidus var. *festinatus* WHEELER, Trans. Tex. Acad. Sci., IV, II, No. 2, p. 22, 1902.

Worker major. Length, 8–10 mm.; head, 3 x 2.6 mm.; scape, 2.6 mm.; hind tibia, 3 mm.

Head rather small, longer than broad, broader behind than in front, with feebly excised posterior border and rather convex sides. Eyes slightly convex. Mandibles 7-toothed. Clypeus carinate, moderately produced in front as a broad flap-shaped lobe, rounded at the sides and slightly sinuate in the middle. Antennal scapes rather long, reaching about one-quarter their length beyond the posterior corners of the head, terete at the base, neither flattened nor dilated. Thorax slender, evenly arched above; base of epinotum fully twice as long as the sloping declivity. Petiole with convex anterior and flattened

posterior surface and rather sharp border. Gaster of the usual shape. Legs slender; middle and hind femora scarcely compressed, elliptical in cross-section, not sulcate.

Mandibles shining, sparsely punctate. Head rather coarsely, thorax and gaster more finely shagreened, so that the head, especially in front, is opaque or subopaque, its posterior corners, the thorax and, especially the gaster, more shining. Whole of head, except the spaces between the eyes and the frontal carinae, covered with sparse, elongate foveolae, which are deepest and largest on the cheeks, clypeus and front.

Hairs tawny yellow, abundant and erect on all parts of the head and gaster, thoracic dorsum, fore coxae and petiolar border. Femora with a few scattered erect hairs on their flexor and posterior surfaces; tibiae with very short slanting hairs; middle and hind pairs without graduated bristles on their flexor surfaces. Antennal scapes with short, erect and delicate hairs, in some specimens abundant, in others very sparse or almost absent. Fringe of hairs on the clypeal border short. Pubescence short and dilute, but distinct on the head, thorax, gaster and antennae.

Clay-yellow; legs somewhat paler than the body, head more reddish, with the mandibles, cheeks, border of the clypeus, vertex and middle portion of the antennal scapes to a variable extent dark brown or blackish. In some specimens the whole head, except the occipital border, is dark brown. Each gastric segment with a more or less distinct transverse brown band, broadened in the middorsal line.

Worker minor. Length, 6-7 mm.

Head, excluding the mandibles, more than twice as long as broad, distinctly narrowed behind, with long, straight, parallel cheeks. Lobe of clypeus without median sinuosity and with short, sharp, lateral corners. Thorax very low and slender, base of epinotum more than three times as long as the declivity. Petiole in profile conical, with blunt border. Legs and antennae long and slender.

Head, thorax and gaster moderately shining, very finely shagreened; foveolae of the head represented only by a few, faint, elongate impressions on the cheeks.

Hairs pale yellow, less abundant than in the worker major. Erect hairs on the antennal scapes shorter and more delicate, lacking on the legs. Pubescence extremely short and dilute, visible only on the gaster and scapes.

Pale clay-yellow throughout; mandibular teeth and edge of clypeus and cheeks brown or black.

Female. Length, 11-14 mm.

Resembling the worker major in sculpture, pilosity and color, but with the head narrower behind and with straighter, more parallel sides. Insertions of wings and anterior edge of scutellum black. Mesonotum immaculate, at most with brownish streaks representing the underlying musculature seen through the thin, yellow integument. Wings tinged with yellow; veins and stigma pale brown.

Male. Length, 6-7 mm.

Head somewhat longer than broad, with rather large eyes and ocelli,

rounded and broader behind, with slightly concave, subparallel cheeks which are somewhat shorter than the eyes. Mandibles narrow, edentate. Clypeus carinate, with broadly rounded anterior border. Antennæ slender, first funicular joint incrassated at its tip, nearly as long as the second joint. Thorax robust, epinotum sloping, base not more than half as long as the declivity. Petiole very low and thick, transverse, its upper surface flattened and somewhat impressed in the middle, without a border.

Head and thorax moderately shining, the former subopaque behind; gaster smoother, surface of body very finely shagreened.

Erect hairs pale yellow, rather abundant, covering the thorax as well as the head and gaster, absent on the scapes, cheeks and legs. Femora and tibiæ with minute, appressed hairs.

Brownish yellow; posterodorsal portion of head, scutellum and upper surface of gaster, except the anterior and posterior borders of the segments, dark brown. In some specimens, the whole thorax or only its dorsal surface and the epinotum are light brown.

This variety was first very inadequately described by Buckley from specimens taken in Texas, in all probability near Austin. I have re-described it from topotypes. It is represented among my material by numerous specimens from the following localities:

Texas: Austin and throughout Travis County (topotypes); San Antonio, New Braunfels, San Angelo, Marble Falls, Kenedy, Brownwood and Terlingua (Wheeler); Laredo (J. F. McClendon); Dimmitt County (Schaupp); Chisos Mts. (O. W. Williams); Abilene (A. W. Morrill); Kerrville (F. C. Pratt); Lampasas (W. D. Hunter).

Arizona: Nogales (Oslar); Huachuca Mts. (H. Skinner and Wheeler).

Mexico: Cuernavaca (Wheeler); Guadalajara (J. F. McClendon).

Worker major specimens, often in the same colony, are extremely variable in the coloration of the head. In general they agree very well with Roger's description of *C. fumidus* from Venezuela, but he does not mention the erect hairs on the antennal scapes. On this account, Emery regarded his specimens, which came from Colorado, as representing a variety, which he called *pubicornis*. As there is no question in my mind concerning the identity of this form with Buckley's *festinatus*, and as long series of specimens from all the localities mentioned above show the erect hairs on the antennal scapes, I believe that I am justified in consigning *pubicornis* to the synonymy.

C. festinatus nests in the ground under stones, logs or dried cow dung in dry sunny pastures. It forms colonies varying from a few to several hundred individuals. It is extremely timid, and, as I have never seen it abroad during the day-time, I infer that it must be either crepuscular or nocturnal. This is also indicated by the very pale coloration of the minor workers.

15. *C. fumidus* var. *fragilis* Pergande

Camponotus fragilis PERGANDE, Proc. Calif. Acad. Sci., (2) IV, p. 26, ♀, 1893;
FOREL, Biol. Centr. Amer., III, p. 133, 1899-1900.

C. fumidus var. *fragilis* EMERY, Zool. Jahrb. Abth. f. Syst., VIII, p. 336, 1894.

Differing from *festinatus* only in its paler color. Both worker major and minor are pale, whitish yellow; the former with the mandibles and antennal scapes pale brown and pale brown bands on the gaster. The pilosity is like that of *festinatus*, and the antennal scapes have numerous, very delicate, white, erect hairs. The female and male are unknown.

This variety was originally described from San José del Cabo and San Fernando, Lower California (G. Eisen). I have examined three cotypes. One worker major and one minor which I took at Alamito, Presidio County, Texas, seem to belong to this variety, but the yellow tint of the body is deeper and more like that of *festinatus*. They may represent very pale specimens of this variety.

16. *C. fumidus* var. *spurcus* var. nov.

Differing from *festinatus* in the darker coloration of the workers and female. In all of these phases the body is more sordid yellow; the worker major has the whole dorsal surface of the head dark brown or black, the mandibles deep red, with black borders, the antero-median portion of the clypeus and anterior portion of the front reddish, the antennal scapes, except their extreme base and apex, black, the dorsal surface of the thorax and petiole and the bands on the gaster dark brown. The femora and tibiae may also be more or less infuscated. In the minor worker, the posterior portion of the head and often also the thoracic dorsum are brown. The female is colored like the worker major, with the mesonotum and scutellum dark brown and subopaque and the bands on the gaster darker and broader than in the female *festinatus*. Tarsi, antennal scapes and funiculi brown. I have not seen the male.

Described from numerous specimens collected by myself in southwestern Texas (Toronto and Paisano Pass, in Brewster County, and at Fort Davis) and a female and worker taken by Oslar in the Huachuca Mts., Arizona. There can be little doubt that in the dry regions of Mexico, western Texas and southern Arizona, both this variety and *fragilis* will be found to be connected with *festinatus* by numerous transitional forms.

17. *C. vafer* sp. nov.

Worker major. Length, 12-14 mm.; head, 3.5 x 3 mm.; scape, 2.8 mm.; hind tibia, 3.2 mm.

With the stature of *vicinus*. Head resembling that of *vicinus* in shape. Mandibles 5- to 6-toothed. Eyes rather convex. Clypeus keeled, its anterior border distinctly notched in the middle, with a short, rounded lobe on each

side, separated by a rather deep notch or sinuosity from the lateral corner of the sclerite. Antennal scapes slender at the base, neither flattened nor dilated, enlarged towards the tip. Thorax long and slender, low in profile and regularly arched above; epinotum sloping, its base nearly twice as long as the declivity. Petiole rather high and narrow, with feebly convex anterior and posterior surfaces and blunt border. Legs long; middle and hind tibiae somewhat flattened, triangular in cross-section, grooved on their anterior surfaces.

Shining throughout, head more opaque behind; mandibles coarsely striato-punctate; head densely shagreened and covered with sparse punctures or foveolae, which are large and elongate on the cheeks, clypeus and front, small and round on the sides. Thorax and gaster very finely and superficially shagreened.

Pilosity yellow, resembling that of *vicinus* but more abundant; mandibles, clypeus, cheeks and sides of head with short, erect hairs; antennal scapes with numerous short, stiff hairs arising from coarse punctures; hairs on the clypeal border short and inconspicuous. Legs with very short, scattered and oblique hairs; flexor surfaces of middle and hind tibiae without rows of bristles. Pubescence very feebly developed, especially on the thorax and gaster, where it is very short and scattered, somewhat longer and more conspicuous on the posterior portion of the head.

Mandibles and head dark reddish brown or black, clypeus and front usually paler. Antennal scapes dark brown, yellow at the extreme base; funiculi yellow, first joint brown. Thorax clay yellow, sometimes brownish on the pro- and mesonotum. Petiole and legs yellow, tarsi and tibiae sometimes brownish or reddish. Gaster dark brown, posterior borders of segments and base of first segment clay-yellow.

Worker minor. Length, 8-10 mm.

Head much as in *vicinus*, longer than broad, with parallel sides and rounded posterior border. Clypeus like that of the worker major. Antennae long and slender. Thorax narrow. Petiole very blunt, almost conical. Legs long and slender.

In sculpture and pilosity very similar to the worker major, even to the foveolae on the head and the short, erect hairs on the antennal scapes and sides and front of head. Color also similar, but the head is pale brown, the clypeus, cheeks and front yellow and the yellow at the base of the gaster is more extensive, sometimes embracing the whole of the first and much of the second segment.

Female. Length, 14 mm.

Resembling the worker major in sculpture, pilosity and color. Base of epinotum much longer in proportion to the declivity than in *vicinus*. Petiole broader, with more acute border. Wings long (13 mm.), strongly suffused with yellow; veins and stigma brownish yellow.

Described from numerous workers taken by Mr. C. R. Biederman from two large colonies nesting under stones at Palmerlee, Arizona, (5000 and 6000 ft.) and a single female taken by Dr. H. Skinner in the Huachuca Mts. of the same territory.⁵

⁵ I have taken this species in Hunter's Canyon in the same mountains.

This species is evidently rather closely related to both *C. festinatus* and *C. ocreatus*, but is readily distinguished from the former by its greater size, the shape of the clypeus, the coloration, the stiffer hairs on the scape and coarser foveolation of the head, from the latter by the shape of the clypeus, foveolation of the head, coloration of the legs and the presence of erect hairs on the antennal scapes.

18. *C. acutirostris* sp. nov.

Worker major. Length, 12–13 mm.; head, 3.5 x 3.3 mm.; scape, 3 mm.; hind tibia 3.9 mm.

With the stature of *vicinus*, but with a proportionally smaller head, which has rounded, convex cheeks and posterior corners and broadly excised posterior border. Eyes feebly convex, rather large. Mandibles 6-toothed. Clypeus carinate, produced in front as a pointed angle, which is slightly turned up at the tip. Just behind this tip the carina is interrupted for a short distance by a feeble transverse impression. The anterolateral border of the clypeus is deeply sinuate on each side. Frontal area and groove distinct; frontal carinae feebly lyrate and more approximate than in *vicinus* and *vafer*. Antennal scapes slender and terete at the base, neither flattened nor dilated, slightly enlarged at their distal ends. Thorax narrower than the head and shaped much as in *vicinus*, but the epinotum is more like that of *vafer*, having its basal surface about twice as long as the declivity. Petiole high and rather narrow, with both anterior and posterior surfaces convex, the former more than the latter; border sharp, feebly emarginate in the middle above. Gaster of the usual shape. Legs long; middle and hind tibiae sulcate on their anterior surfaces and rather triangular in cross section.

Head subopaque, densely shagreened; mandibles, cheeks, gula, sides, frontal area and anterior half of front rather smooth, shining. Mandibles finely and densely striate and coarsely punctate. Cheeks with numerous elongate foveolae; clypeus, front and vertex with large, more scattered and rounded foveolae. The punctures on the sides of the head very small and scattered. Thorax subopaque and shagreened like the head; petiole and gaster more finely shagreened, shining.

Hairs yellow, erect, rather short and sparse on the upper surface of the head, thorax and gaster and border of petiole, more numerous on the gula. Marginal hairs of clypeus rather long and prominent. Cheeks with a few short, erect hairs. Femora with a row of long, sparse hairs on their flexor surfaces; tibiae without hairs on their extensor surfaces, but with a row of stiff graduated bristles along the whole length of their flexor surface. Pubescence very short and dilute, discernible only with difficulty except on the scapes.

Head black; mandibles, clypeus and frontal area deep red; antennal scapes black, with yellow or red bases and tips; funiculi brown or yellow. Thorax and legs yellowish brown; pronotum and, to a less extent, the mesonotum sometimes blackish or dark brown; tibiae and tarsi light brown. Gaster brown, with yellow posterior borders to the segments; venter and base or whole of first segment yellow.

Worker minor. Length, 7.5–9 mm.

Head longer than broad, with straight parallel sides, postocular portion prolonged and rounded, but distinctly narrowed at the occiput. Clypeus like that of the worker major, but the point in the middle of the anterior margin is more obtuse and less projecting. Antennæ very slender. Thorax through the pronotum about as broad as the head. Epinotum low, with its base twice as long as the declivity into which it passes without a perceptible angle. Petiole thick and rather conical, with blunt, entire lateral and dorsal border.

Sculpture and pilosity much as in the worker major. Cheeks with a few scattered, erect hairs.

Dull yellow; mandibles and cheeks brown; sides and posterior portions of head darker; dorsal surface of gaster, with the exception of the posterior edges of the segments, light brown. Antennal scapes and tarsi brownish.

Female. Length, 13 mm.

Resembling the worker major in sculpture, pilosity and color. Head narrower, with straighter, more nearly parallel sides. Epinotum with convex, rounded base, nearly as long as the declivity. Petiole broad and thick, compressed antero-posteriorly near the margin, which is sharp. Thorax smooth and shining, epinotum opaque and shagreened; scutellum, metanotum and pronotum, except for a large anteromedian blotch, dark brown or black. Wings long (15 mm.), scarcely tinged with yellow near the costal margin; veins brown, stigma blackish.

Male. Length, 10 mm.

Head very small, longer than broad, occipital border straight, not broader than the anterior border and equal to the surface on each side between the posterior orbit and the corresponding end of the occipital border. This surface is not convex, but flat. Cheeks subparallel, straight, not concave. Clypeus with broadly rounded border and reflected edge. Mandibles indistinctly bidentate. Thorax through the insertions of the wings nearly twice as broad as the head, narrowed behind, with the epinotum as long as broad, rounded and sloping in profile, without distinct basal and declivous surfaces. Petiole very low, thick and blunt, as long as high. Gaster, antennæ and legs long and slender.

Mandibles and head subopaque, very finely shagreened; clypeus, cheeks and front with a few coarse punctures. Thorax shagreened like the head, subopaque in front; scutellum, epinotum and gaster smooth, shining, more finely and superficially shagreened.

Hairs pale, short, erect and sparse, most abundant on the gaster, absent on the scapes and tibiae, present in a single row on the flexor surfaces of the femora.

Black; mandibles, distal portion of antennal scapes, genitalia and tarsi brown; articulations of thorax, gaster and legs whitish. Wings whitish hyaline, with pale yellow veins and brownish stigma.

Described from numerous workers, one female and one male taken from a single colony living in the ground under a stone at Alamogordo in the foot-hills of the Sacramento Mts. of New Mexico (G. von Kroc-

kow), and several workers from Box Canyon in the same territory (A. G. Ruthven).

This species is readily distinguished from all our other *Camponoti* by the peculiar shape of the clypeus in the worker and female phases. Its other characters are, however, so much like those of the preceding forms, notably *C. ocreatus* and *vafes*, that it must be included in the *maculatus* group. The resemblance to *ocreatus* is even closer in the following subspecies.

19. *C. acutirostris primipilaris* subsp. nov.

Worker major. Length, 15 mm.

Differing from the worker major of the typical form in its large size, in lacking the deep, elongated foveolæ and erect hairs on the cheeks and in coloration. The whole head, including the scapes and first funicular joint of the antennæ, the tips of the femora, the whole of the tibiæ, the dorsal portions of the pro- and mesonotum, black.

Worker minor. Length, 10–11 mm.

Resembling the worker major in sculpture, pilosity and coloration, but without black on the dorsum of the pro- and mesonotum.

Female. Length, 16–17 mm.

Like the worker major. Pro- and mesonotum, scutellum and metanotum black; pleuræ, epinotum, coxæ, petiole and femora brown; gaster black, first and also the second segment, except its posterior border, yellowish brown. Petiole with the upper border more or less excised in the middle. Wings distinctly suffused with yellow; veins and stigma brown.

Described from a single worker major taken by C. R. Biederman at Palmerlee, Arizona, 5500 ft.); six minor workers and a media taken by W. M. Mann in Ramsey Canyon, Huachuca Mts., Arizona, and three females taken by Dr. H. Skinner at Nogales in the same territory.⁶

This subspecies in the coloration of the antennæ and legs closely resembles *ocreatus*, but it is readily distinguished by its larger size and by its clypeal border which is angular and pointed like that of the typical *acutirostris*.

20. *C. socius* Roger

ROGER, Berlin Ent. Zeitschr., VII, p. 140, ♀, 1863; FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, p. 74, ♀, 1879; MAYR, Verh. zool. bot. Ges. Wien, XXXVI, p. 422, ♀, 1886; DALLA TORRE, Catalog. Hymen., VII, p. 253, 1893; EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 670, 1893.

Worker major. Length, 11–13 mm.; head, 3.3 x 3.2 mm.; scape, 3.5 mm.; hind tibia, 3.5 mm.

⁶ Since the above was written, I have found this subspecies very abundant in various canyons of the Huachuca Mts. It nests under stones at altitudes of between 5000 and 6000 ft.

Head but little longer than broad, broader behind than in front, with slightly excised posterior border and slightly convex cheeks, convex dorsal and flattened gular surface. Eyes moderately large, feebly convex. Mandibles 6-toothed. Clypeus rather indistinctly carinate, its anterior border produced as a broad lobe, rounded on the sides and sinuately excised in the middle. Frontal carinae lyrate. Antennal scapes flattened but not dilated at the base, thickened towards the tips, which reach well beyond the posterior corners of the head. Thorax rather robust, in front narrower than the head, laterally compressed behind; in profile with evenly arched dorsum. Epinotum rounded, its base fully twice as long as the sloping declivity. Petiole rather high and narrow, with strongly convex anterior, more feebly convex posterior surface and blunt, rounded margin. Gaster of the usual shape. Legs long, middle and hind tibiae distinctly flattened.

Mandibles shining, striatopunctate near the teeth, but elsewhere with scattered punctures. Body, femora and antennae opaque, very minutely and densely punctate, tibiae somewhat shining. Clypeus and sides of head with small, scattered punctures.

Hairs and pubescence yellow, the former moderately abundant but short, present on the postero-lateral portions of the head but not on the cheeks; on the legs short, scattered and oblique, except on the flexor surfaces of the femora, where there is a row of long erect hairs. Middle and hind tibiae with a row of rather short, graduated bristles extending nearly their entire length. Scares without erect hairs. Pubescence short and sparse, distinct only on the dorsum of the gaster.

Ferruginous red; mandibles and scapes darker; anterior border of clypeus and cheeks black. Gaster black, with golden yellow posterior border to each segment, a broad transverse golden band on the first, and another at the base of the second segment.

Worker minor. Length, 7.5–10.5 mm.

Head longer than broad, slightly broader in front than behind, with rounded postocular portion and feebly convex sides. Clypeus more distinctly carinate than in the worker major, broadly rounded in front, with a very faint median notch. Antennal scapes very slightly flattened at their bases. Thorax similar to that of the worker major, but base of epinotum fully three times as long as the declivity. Petiole longer than broad, but higher than long, thick and subconical, with blunt border.

Sculpture, pilosity and color as in the worker major, but mandibles not darker than the remainder of the head, clypeus somewhat yellowish and antennal scapes red like the funiculi.

Female. Length, 15–16 mm.

Pale ferruginous, antennal funiculi, gaster and legs more or less yellowish red, mandibles reddish brown, scutellum, especially near its edges, and the tarsi brown, posterior border of gastric segment and anterior portion of same, excepting the first segment, dark brown. Pilosity as in the worker, but sparser. Head as in the major worker very finely and densely punctate, partly finely shagreened, and in addition, especially on the clypeus and cheeks, with scattered punctures. Mandibles nearly smooth, with scattered punctures.

6-toothed. Clypeus not carinate, its anterior border produced as in the worker major and with rounded corners mesial to the excisions. Thorax finely reticulate-rugulose, above moderately shining. Petiole moderately thick, with rounded upper border. Gaster very finely transversely rugulose.

Male. Length, 9 mm.

Head longer than broad; rounded behind; cheeks subparallel, concave, as long as the eyes. Clypeus convex, scarcely carinate, with rounded anterior border. Mandibles edentate. Eyes rather small. Antennæ slender, scapes not flattened at the base, first funicular joint very feebly incrassated, as long as the second. Thorax robust, epinotum rounded, sloping, with subequal base and declivity. Petiole low and thick, upper border sharp, distinctly excised in the middle. Gaster small; legs and antennæ long and slender.

Surface of body shining; head and thorax more coarsely, gaster much more finely and superficially shagreened. Mandibles subopaque, finely punctate.

Pilosity similar to that of the worker, but erect hairs absent on thorax, on legs much shorter and appressed.

Chestnut brown; anterior portion of head, antennæ, legs, articulations of thorax and edges of gastric segments yellowish brown. Wings faintly suffused with yellow; veins and stigma pale yellow.

This species, originally described from Brazil, enters the United States only in southern Florida. The description is drawn from several workers and two males, some of which were taken by the late Rev. Jerome Schmitt at Sanford, while others are labeled simply Florida and belong to the American Museum of Natural History. Forel redescribed the worker from specimens taken at Green Cove Spring by Mrs. Mary Treat. Both Mayr and Emery saw specimens from Florida. The description of the female is translated from Mayr.

21. *C. castaneus* Latreille

Formica castanea LATREILLE. Hist. Nat. Fourm., p. 118. Pl. III, Figs. 11, 12 A. C. and D., ♀ ♀ ♂, 1802.

Formica mellea SAY, Bost. Journ. Nat. Hist., I, 3, p. 286. ♂, 1836; LECONTE, Writings of Thos. Say, II, p. 731, ♂, 1859.

Camponotus melleus MAYR, Sitzb. Akad. Wiss. Wien, LIII, p. 485. ♀ ♀ ♂, 1866; FOREL, Bull. Soc. Vaud. Sci. Nat., XVI, P. 81, p. 60, ♀ ♀ ♂, 1879.

C. castaneus MAYR, Verh. zool. bot. Ges. Wien, XXXVI, p. 420. ♀ ♀ ♂, 1886; FOREL, Ann. Soc. Ent. Belg., XXX, p. 141, 1886; DALLA TORRE, Catalog. Hymen., VII, p. 224, 1893; EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 673, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XXI, p. 402, 1905; Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 22, 1906.

Worker major. Length, 9-10 mm.; head, 3.2 x 2.8 mm.; scape, 3 mm.; hind tibia, 3.4 mm.

Head small, but little broader behind than in front, with rounded sides and feebly excised posterior border. Eyes somewhat convex. Mandibles 6- to 7-toothed. Clypeus convex in the middle, ecarinate or bluntly and indistinctly

carinate; its anterior border broadly rounded, not produced, sinuate at the sides, with crenate edge. Frontal carinae lyrate, rather far apart. Frontal area indistinct, extremely small; frontal groove distinct. Antennal scapes rather long, reaching about one-third their length beyond the posterior corners of the head, their bases terete, neither flattened nor dilated, distal ends not incrassated. Thorax slender, laterally compressed, moderately high, in profile rather evenly arched above; epinotum with indistinct base and declivity, the former about twice as long as the latter. Petiole thick, with strongly convex anterior and flattened posterior surface and very blunt, rounded and entire margin. Gaster of the usual form. Legs long; middle and hind tibiae neither compressed nor sulcate, elliptical in cross section.

Whole body shining, very finely and superficially shagreened, more coarsely on the anterior portions of the head. Mandibles coarsely and uniformly punctate. Cheeks with small, slightly elongated foveolae, or punctures; sides of clypeus and front feebly punctate.

Hairs yellow, erect and sparse, very short on the mandibles, rather long on the border of the clypeus, absent on the sides and corners of the head and on the legs and scapes, except at the tips of the latter and of the femora. Middle and hind tibiae with a series of short bristles on the distal half of their flexor surface. Pubescence very short, dilute and indistinct.

Yellow or yellowish red, head and gaster somewhat darker; mandibles, antennal scapes, anterior border of clypeus and cheeks very dark red or blackish; tibiae and tarsi also sometimes brown or dark red. Gastric segments sometimes obscurely brownish posteriorly. Mandibular teeth black.

Worker minor. Length, 7-8 mm.

Head somewhat less than twice as long as broad, sides subparallel, slightly convex, postocular portion rounded, slightly contracted towards the occipital border. Clypeus similar to that of the worker major, but more truncated in front. Antennae long and slender, the scapes reaching nearly half their length beyond the posterior corners of the head. Sculpture, pilosity and coloration like that of the worker major.

Female. Length, 13-15 mm.

Closely resembling the worker major, but the head has straighter and less convex sides, the petiole is much compressed anteroposteriorly, with a rather sharp border, which is distinctly notched in the middle above, and the color of the whole body is often deeper and more brownish. Wings long (15 mm.), strongly suffused with yellow; veins and stigma brownish yellow.

Male. Length, 8-9 mm.

Head longer than broad, but little broader behind than in front; cheeks concave, subparallel, about as long as the eyes, which are moderately large. Clypeus convex, but not carinate, with broadly rounded anterior border. Mandibles edentate, rather broad. Thorax robust, epinotum convex, without distinct basal and declivous surfaces. Petiole low, thick, transverse and very blunt above. Gaster, antennae and legs slender.

Sculpture, pilosity and color like those of the female, but hairs shorter and less conspicuous, absent on the cheeks and thorax, except the epinotum, which

bears a few erect hairs. Mandibles scarcely darker than the head; mesonotum often streaked with brown. Wings colored like those of the female.

The types of this species, which is easily recognized by the red color of all the phases, came from the Carolinas and Pennsylvania. I have seen no specimens from British America or from any portion of the Union west of the one hundredth meridian. Mayr's citation of specimens of this or the following subspecies from California, Colorado and New Mexico is very questionable. The material before me represents the following localities:

North Carolina: Belmont (Jerome Schmitt); Raleigh (F. Sherman).

Maryland: Chestertown (H. Viereck); Georgetown, D. C. (E. G. Titus).

Virginia: Ashland (J. F. McClendon).

Florida: (Amer. Mus. Nat. Hist.).

Louisiana: Mansfield (R. C. Howell).

New Jersey: Caldwell (E. T. Cresson); Sea Isle City (H. Viereck); Fort Lee (W. Beutenmueller and Wheeler); Great Notch (Wheeler).

New York: West Farms (J. Angus).

Connecticut: Westville (W. E. Britton).

Massachusetts: Cambridge (Mus. Comp. Zool.).

Indiana: Bass Lake, Hammond and Mount Vernon (W. S. Blatchley).

Although thus widely distributed through the eastern half of the Union, *C. castaneus* seems nowhere to be common except, perhaps, in the South Atlantic states. It forms moderately populous colonies, which nest in the ground under stones in open woods, in the same manner as the species of the *maculatus* group. The workers are very timid and probably nocturnal.

22. *C. castaneus americanus* Mayr

C. americanus MAYR, Verh. zool. bot. Ges. Wien, XII, p. 661, ♂ ♀, 1862.

C. castaneus MAYR: *Ibid.*, XXXVI, p. 420, 1886; DALLA TORRE, Catalog. Hymen., VII, p. 223, 1893.

C. castaneus subsp. *americanus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 674, ♂ ♀ ♂, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XXI, p. 402, 1905; Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 22, 1906.

This subspecies, as Mayr and Emery have observed, is highly variable in color, and this is true of individuals of the same colony. The only features in which it seems always to differ from the typical *castaneus* are the deeper and more elongate foveolæ on the cheeks of the major workers and the coloration of the head, which is black or dark brown in all four phases, with the mandibles, clypeus and cheeks more or less brown or reddish. The thorax, gaster, legs and antennæ of the worker major may be dirty or clay-yellow throughout, but usually the dorsal surface of the thorax, especially of the mesonotum, and a

broad transverse band on each gastric segment are light or dark brown. Some specimens have the thorax and gaster piceous, with the thoracic dorsum and gastric bands black; or more rarely the body may be black, with the pronotum, legs and petiole dark red or brown. In the female, the thorax is nearly always black above, the gaster dark brown or with yellow base and pale borders to the segments. The male usually has the thorax, gaster, petiole, legs, antennæ and anterior portions of the head brown or piceous, but specimens are occasionally found with the thorax and gaster black. The wings of the female and male are, as a rule, less suffused with yellow than in the typical *castaneus*.

C. americanus occurs over much the same territory as *castaneus*, but it ranges further north and is much more common. I have seen specimens from the following localities:

New Hampshire: Pelham (Bridwell).

Massachusetts: Weston, Newton and Middlesex Fells, Boston (A. P. Morse); Essex County and Mt. Tom (G. B. King); Sutton (Bost. Soc. Nat. Hist.); Andover (Morse and King); Medford (Dall); Blue Hills, Arnold Arboretum, Boston and Ellenville (Wheeler).

New York: Montgomery; Staten Island (W. T. Davis).

Pennsylvania: Rockville (H. Viereck); Edge Hill (Greene).

New Jersey: Manumuskin, Iona and Da Costa (C. Daecke); Jamesburg and Patterson (W. T. Davis); Halifax, Newfoundland and Lakehurst (Wheeler); Lacy; Fort Lee (W. Beutenmueller).

North Carolina: Black Mts. (W. Beutenmueller); Lake Toxaway (Mrs. A. T. Slosson).

Georgia: Clayton, 2000–3000 ft. (W. T. Davis); Chickamauga.

Florida: Quincy (W. A. Hooker).

Indiana: Wyandotte and Mitchell (W. S. Blatchley).

Illinois: Rockford (Wheeler).

Missouri: (Forel).

Indian Territory: Ardmore (C. R. Jones).

Oklahoma: Ponca City (A. C. Burrill).

Texas: College Station (F. C. Pratt); Palestine (F. C. Bishopp); Calvert (C. R. Jones).

C. americanus is as variable in color as the typical *castaneus* is constant. As these forms are distinguished merely by the coloring of the head and the foveolation of the cheeks, *americanus* would properly be merely a variety, but I have followed Emery in regarding it as a subspecies, for the reason that I have been quite as unsuccessful as he has been in finding transitions between the two forms.

II. *Abdominalis* Group23. *Camponotus floridanus* Buckley

Formica floridana BUCKLEY, Proc. Ent. Soc. Phila., VII, p. 161, ♀, 1866.

Camponotus atriceps stirps *Yankee* FÖREL, Bull. Soc. Vaud. Sci. Nat., (2) XX, p. 340, ♀, 1884.

C. atriceps var. *floridanus* MAYR, Verh. Zool. bot. ges. Wien, XXXVI, p. 423, ♀ ♀ ♂, 1886.

C. floridanus DALLA TORRE, Catalog. Hymen., VII, p. 231, 1893.

C. abdominalis subsp. *floridanus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 670, 1893.

Worker major. Length, 8–10 mm.; head, 3.5 x 3.4 mm.; scape, 2.7 mm.; hind tibia, 3 mm.

Head large, nearly as broad as long, broader behind than in front, with broadly excised posterior and convex lateral margins. Eyes flattened. Mandibles 5- to 6-toothed. Antennæ short, scapes flattened at the base but not dilated, enlarged towards their tips, which do not extend beyond the posterior corners of the head. Clypeus carinate, its border produced as a prominent lobe with sharp corners, between which the median edge is angularly excised. Frontal carinæ lyate, rather far apart; frontal area small, triangular; frontal groove distinct. Thorax robust, narrower than the head in front, compressed and more narrowed in the pleural region; in profile rather unevenly arched, with deep pro-mesonotal suture, highest in the mesonotal region; epinotum depressed, sloping, with indistinct and subequal base and declivity. Petiole in profile cuneate, with similar, feebly convex anterior and posterior surfaces; seen from behind, evenly rounded above, with rather blunt border. Legs moderately long and robust; middle and hind tibiæ neither compressed nor sulcate, elliptical in cross section.

Mandibles opaque, very finely striated and sparsely punctate; teeth smooth and shining. Head opaque, very densely and minutely punctate or shagreened. Cheeks with small, scattered foveolæ; clypeus and lateral borders of front with a few large piligerous foveolæ. Thorax, gaster and legs moderately shining, more superficially shagreened.

Hairs coarse, long, fulvous, erect, rather abundant, shorter on the anterior surface of the antennal scapes and on the legs, absent on the cheeks and sides of the head, very short on the mandibles and clypeal border. Pubescence very short and dilute, distinct only on the gaster.

Head ferruginous red; mandibles, antennal scapes and anterior border of cheeks and clypeus darker. Thorax and legs more yellowish red. Gaster black, with the posterior edges of the segments narrowly yellow.

Worker minor. Length, 5.5–7 mm.

Head, excluding the mandibles, about twice as long as broad, with straight, parallel sides and short evenly rounded postocular portion. Eyes rather large and convex. Clypeus like that of the worker major. Antennæ slender, scapes not flattened at the base, reaching about half their length beyond the posterior corners of the head. Thorax low, narrow and evenly arcuate above, epinotum without distinct base and declivity. Petiole like that of the worker major.

Head more shining and sometimes of the same yellowish red color as the thorax and legs. Antennæ dark red throughout. Pilosity as in the worker major.

Female. Length, 13–15 mm.

Head broad, much like that of the worker major. Dorsum of thorax and gaster smoother and more shining. Petiole compressed anteroposteriorly, with sharper border, somewhat notched in the middle above. Color and pilosity as in the worker major, except that the erect hairs are shorter and somewhat sparser, and that in some specimens (probably immature) the mesonotum has three pale brown blotches. Wings long (14 mm.), grayish hyaline, suffused with yellow only near the costal margin; veins and stigma yellowish brown.

Florida: Lake Worth (Jerome Schmitt); Miami and Key Largo (Wheeler); Caloosahatchie River (Heil).

Georgia: St. Mary's (O. Bangs).

This ant is not uncommon in southern Florida, nesting in old stumps and logs. Like the other subspecies of *abdominalis*, which are widely distributed over tropical America, it is very pugnacious. Occasionally it is found nesting in epiphytes in the green-houses of the northern states. I have before me a series of workers taken by Mr. G. von Krockow from a vigorous colony that had been living for some time in one of the hot-houses of the New York Botanical Garden. The male, which I have not seen, is described by Mayr as indistinguishable from that of the typical *abdominalis* of Brazil, and it is probably very much like the male of the subspecies *transvectus* described below.

24. *C. abdominalis transvectus* subsp. nov.

Worker major. Length, 8–9 mm.

Resembles *floridanus*, but differs in the smaller average size and in the following particulars: foveolæ on the cheeks elongated and deeper; cheeks and sides of head with erect hairs; vertex of head very dark brown or black; hairs somewhat more abundant, especially on the antennal scapes; pubescence longer and more conspicuous. Thorax, legs and gaster colored as in *floridanus*.

Worker minor. Length, 6–7 mm.

Differing from the worker minor of *floridanus* in the same characters as the worker major.

Female. Length, 12 mm.

Resembling the worker major, but with the mesonotum and scutellum blotched with black. Wings as in the female *floridanus*.

Male. Length, 7 mm.

Head through the eyes about as broad as long; cheeks converging somewhat anteriorly, shorter than the eyes. Mandibles rather broad, bidentate. Thorax robust, with rather steep epinotum, its base shorter than the declivity, which is slightly concave. Petiole low and thick, transverse, with blunt margin. Gaster small, legs and antennæ slender.

Surface subopaque, very densely and finely shagreened, gaster shining.

Hairs pale yellow, abundant, shorter than in the minor worker. Cheeks with a few erect hairs. Antennal scapes naked, legs with minute oblique hairs.

Dark brown; mandibles, clypeus, antennæ and gaster black; pleuræ and legs light brown; genitalia, funiculi, tarsi and articulations of legs and thorax yellowish. Wings dull hyaline, with pale yellow veins and stigma.

Described from ten workers, two females and a single male, taken by Mr. J. D. Mitchell at Harlington, Cameron County, Texas, and a single worker taken by the same collector at Brownsville, Texas.

I have described this form as a subspecies, although its exact status is doubtful, owing to the extreme variability of the species, which is in urgent need of revision. The same form, which I took some years ago at Cuernavaca, was identified by Professor Forel as "*C. abdominalis*, new subspecies between *esuriens* F. Smith and *mediopallidus* Forel." I have since received it also from Juanacatlan, Mexico (J. F. McClendon). Other specimens from Tuxpan, sent by the same collector, have the head of the major and minor worker yellowish red like the thorax and legs, and numerous specimens collected at Esquinapa by Mr. J. H. Batty and at Guadalajara by Mr. McClendon have paler heads and no hairs on the sides of the head. These therefore represent a transition to *floridanus*. All the Mexican specimens are larger than the Texan. As Texas is at the extreme edge of the northern range of the species, we may suppose that this smaller average stature of *transvectus* is a sign of depauperation.

III. *Herculeanus* Group

25. *Camponotus lævigatus* F. Smith

Formica lævigata F. SMITH. Catalog. Hymenop. Brit. Mus., VI, p. 55, No. 197, ♂ ♀, 1858; LORD, Natur. in Vancouver I. and Brit. Col., II, p. 341, 1866.

Camponotus lævigatus MAYR, Verh. Zool. bot. Ges. Wien, XXXVI, p. 420, ♂ ♀, 1886; EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 671, 1893.

C. lævigatus DALLA TORRE, Catalog. Hymen., VII, p. 238, 1893.

Worker major. Length, 10-13 mm.; head, 3.4 x 3.4 mm.; scape, 2.7 mm.; hind tibia, 3.2 mm.

Head as broad as long, somewhat broader behind than in front, with very round, convex sides and posterior corners and scarcely excised posterior border. Eyes small, flat. Mandibles convex, 5-toothed. Clypeus short, evenly convex, without a carina, its anterior border not produced, with a shallow, rounded median excision and a slightly deeper and more angular excision on each side. Frontal area obsolete, frontal groove distinct. Antennæ with short scapes, not reaching beyond the posterior corners of the head, neither flattened nor dilated at the base, distinctly enlarged at the tips. Thorax robust and rather high, narrower than the head in front, laterally compressed behind.

evenly arched above in profile, epinotum with subequal base and declivity meeting in a rounded, obtuse angle. Petiole high, compressed anteroposteriorly, with feebly convex anterior and flattened posterior surface; border entire, evenly rounded and rather blunt. Gaster of the usual shape. Legs of moderate length; middle and hind tibiæ neither compressed nor sulcate, elliptical in cross section.

Entire surface smooth and shining; mandibles coarsely striato-punctate.

Head, thorax, scapes and legs covered with scattered, rather small, but deep punctures; intermingled with these on the cheeks, clypeus, front and vertex, there are large but equally scattered punctures or foveolæ, those on the cheeks being elongated. Gaster very finely, transversely shagreened and with scattered, piligerous punctures. Pubescence apparently lacking.

Hairs white or pale yellow, delicate, abundant, short and erect on the body, longest on the gaster. Antennal scapes and legs with numerous short, erect hairs. Flexor surfaces of middle and hind tibiæ with a few short bristles at their distal ends.

Deep black throughout; mandibles, clypeal border and cheeks rarely deep red; tarsi brownish towards their tips; posterior edges of the gastric segments dull brown.

Worker minor. Length, 7-9 mm.

Head similar to that of the worker major, but little longer than broad, with less convex sides, short and broadly rounded behind. Eyes feebly convex. Clypeus subcarinate. Antennal scapes extending about one-third their length beyond the posterior corners of the head. Epinotum and petiole like those of the worker major, but basal surface of the former longer in proportion to the length of the declivity.

Sculpture, pilosity and color as in the worker major.

Female. Length, 13-15 mm.

Very similar to the worker major. Sides of head less convex. Epinotum with flattened base, shorter than the abrupt, concave declivity. Petiole even more compressed anteroposteriorly than in the worker major, with sharper border, narrowed and feebly excised above. Wings long (15 mm.), strongly tinged with brown; veins and stigma brown.

Male. Length, 9-10 mm.

Head, including the eyes, about as broad as long, evenly rounded and broadest behind; cheeks subparallel, slightly concave, about as long as the eyes. Mandibles edentate. Clypeus convex, but scarcely carinate, with broadly rounded, entire anterior border. Ocelli very small. Antennæ long and slender; first funicular joint incrassated distally, a little longer than the second. Thorax robust; epinotum convex, sloping, without distinct basal and declivous surfaces. Petiole thick, rather high, transverse, evenly rounded and blunt, slightly impressed in the middle above. Gaster slender. Legs long, with long tarsal claws and very large empodia.

Surface of body very finely and densely shagreened; mandibles, head, pro- and mesonotum subopaque, remainder of thorax, gaster and legs shining.

Pilosity similar to that of the worker, but less abundant, absent on the

scapes and thorax, with the exception of the epinotum. Pubescence very short and dilute, but visible on the head, thorax and gaster.

Black; mandibles, antennal funiculi, tarsi and articulations of the legs brown; wings colored like those of the female.

The types of this species, which is very constant and easily recognized by its deep black color, smooth surface and peculiar pilosity, came from California. I have examined specimens from the following localities:

California: Yosemite, Sierra Nevada, Sierra Valley, San Jacinto Mts., 6000 ft. (F. Grinnel, Jr.); Baldy Peak, San Gabriel Mts. (Brewster, Joos and Crawford); Blue Lake, Humboldt County; Felton, Santa Cruz Mts.; Alta Peak (9500–11,000 ft.), Giant Forest to Marble Fork, Sissous (J. C. Bradley); McCloud and Castle Crag (A. Fenyès).

Washington: Seattle (T. Kincaid); Union City (J. C. Bradley).

Oregon: Corvallis (Amer. Mus. Nat. Hist.).

Montana: Weeksville (S. Henshaw).

Idaho: Moscow Mt. (W. M. Mann), Lewiston and Moscow (J. M. Aldrich).

Colorado: Ute Pass and Cheyenne Canyon (Wheeler); South Boulder Canyon and Sugar Loaf (T. D. A. Cockerell).

Utah: Beaver Canyon (C. Schaeffer).

New Mexico: Santa Fé (on *Populus*), Pecos and Glorieta (T. D. A. Cockerell).

Arizona: (A. P. Morse).

Mexico: Gulf of California (A. Agassiz).

As shown by this list of localities, *C. laevigatus* is a mountain ant peculiar to the high ranges of the western states. It extends into Mexico and also for a short distance into British America (Vancouver Island, according to Lord). I believe that it will rarely be found below an altitude of 6000 ft. I have seen it only at elevations of 7000–8000 ft. in the mountains of Colorado. It forms large colonies which nest in dry stumps or logs after the manner of *C. herculeanus* and its various subspecies and varieties. In behavior it closely resembles the south European *C. vagus*.

Emery mentions three female specimens from Descanso, Calif., which seemed to represent a form allied to but distinct from *laevigatus*. These resembled the females of the *herculeanus* group, but had 6-toothed mandibles and an indistinctly carinate clypeus. The whole head was opaque, densely punctate, with scattered piligerous, shallow foveolæ, and the sides of the head bore short, stiff bristles. The tibiæ had short, oblique hairs; the color was like that of the *C. ligniperda* female. I have not been able to find any specimens answering to this description among my material.

26. *C. herculeanus* L. var. *whymperi* Forel

Formica herculeana LORD, Natur. in Vancouver I. and Brit. Col., II, p. 341, 1866.

? *Formica semipunctata* W. KIRBY, Fauna Bor. Amer., IV, p. 262, No. 362, ♀, 1837.

? *Camponotus semipunctatus* MAYR, Verh. Zool. bot. Ges. Wien, XIII, p. 401, 1863.

C. herculeanus FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, p. 57, 1879, 1881; PROVANCHER, Natur. Canad., XII, 81, p. 354, No. 1, ♂ ♀ ♂, 1881; Faune Ent. Canad. Hymén., p. 597, No. 1, ♀ ♀ ♂, 1883; Addit. Faune Canad. Hymén., p. 231, No. 1, 1887; DALLA TORRE, Catalog. Hymen., VII, p. 233, 1893; EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 674, 1893.

C. herculeanus var. *whymperi* FOREL, Trans. Ent. Soc. London, p. 699, ♀ ♀. 1902; Bull. Soc. Ent. Belg., XLVIII, p. 152, 1904; EMERY, Deutsch. Ent. Zeitschr., p. 184, ♂, 1908; WHEELER, Geol. Survey Mich., p. 328, ♂, 1908.

Worker major. Length, 10–13 mm.; head, 3.5 x 3.5 mm.; scape, 2.7 mm.; hind tibia, 3.3 mm.

Head as broad as long, broader behind than in front, with broadly excised posterior border, rather convex sides and swollen cheeks. Eyes moderately large, flat. Mandibles 5-toothed; convex at the base, flattened or slightly concave on their distal halves. Clypeus evenly convex, not carinate, its anterior border scarcely produced, squarely truncated or feebly excised in the middle, with a deeper excision on each side near the cheeks. Frontal area large, subtriangular; frontal groove distinct. Frontal carinae lyrate, rather far apart. Antennal scapes rather short, not extending beyond the posterior corners of the head, terete, neither dilated nor flattened at the base, incrassated distally. Thorax robust, rather high, feebly and evenly arcuate above, narrower than the head, laterally compressed behind; epinotum obtusely angular, with subequal base and declivity, the former feebly convex, the latter feebly concave in profile. Petiole high, compressed anteroposteriorly, with convex anterior and nearly flat posterior surface, its border rounded, entire and rather sharp. Gaster of the usual shape, legs moderately long and stout; middle and hind femora neither compressed nor sulcate, elliptical in cross section.

Opaque; very densely and rather coarsely shagreened: mandibles, eyes, anterior portion, sides, lower surface and posterior corners of head more shining. Mandibles coarsely striato-punctate. Whole head covered with sparse, shallow punctures, which are larger, but not elongated, on the cheeks. Upper surface of thorax and gaster with scattered piligerous foveolæ, the latter also with numerous small, often transverse punctures bearing the pubescence.

Hairs brownish yellow, coarse, short and erect, not very abundant; absent on the cheeks and sides of head. Antennal scapes and legs covered with short slanting or appressed hairs. Pubescence very short, dilute, scarcely visible on the thorax, most distinct on the gaster but not concealing the sculpture.

Black; mandibles, anterior border of head, antennæ, legs, petiole, posterior portion of thorax and the base of the first gastric segment, deep red. Posterior borders of gastric segments dark brown. In some specimens, the posterior portions of the thorax, the mandibles, anterior portion of the head, the antennal

scapes and femora are black. Middle and hind tibiæ with only a few short bristles at the distal ends of their flexor surfaces.

Worker minor. Length, 6-8 mm.

Head somewhat broader than long, but little broader behind than in front, with feebly convex sides and nearly straight posterior border. Eyes slightly convex, clypeus carinate. Antennal funiculus extending about one-third its length beyond the posterior corners of the head. In other respects like the worker major.

Female. Length, 13-16 mm.

Very much like the worker major. Head with somewhat straighter sides, but broader behind than in front. Eyes larger and more convex. Thorax through the wing-insertions scarcely broader than the head; epinotum with convex base, impressed in the middle; declivity longer and distinctly concave. Petiole more compressed than in the worker major, narrow and high, with rounded, entire and more acute border.

Surface throughout more shining than in the worker, especially the thorax, which is quite glabrous above; epinotum opaque, shagreened. Gaster very finely transversely shagreened and covered with small punctures. Mesonotum and gastric segments also with a few scattered piligerous foveolæ.

Pilosity like that of the worker, but sparser and shorter. Pubescence also shorter and sparser, especially on the gaster.

Black; mandibles, legs, antennæ and often also the epinotum, pleuræ and petiole tinged with red. Wings very long (in large specimens 18 mm.), strongly tinged with brown; veins and stigma yellowish brown.

Male. Length, 9-10 mm.

Head through the eyes about as broad as long; broadly rounded behind; cheeks feebly convex, converging anteriorly, as long as the eyes. Ocelli very small. Mandibles edentate. Clypeus convex in the middle, but scarcely carinate, its anterior border broadly rounded and slightly sinuate in the middle. Thorax robust; epinotum with flattened and subequal base and declivity meeting to form a rounded obtuse angle. Petiole rather high, distinctly compressed anteroposteriorly, with thin, rather acute border, which is deeply excised in the middle above.

Opaque; very finely shagreened; gaster shining.

Hairs and pubescence shorter and sparser than in the worker, especially on the head and thorax. Cheeks without hairs. Short hairs on the legs and antennal scapes appressed and scarcely more than pubescence.

Black; mandibles, antennæ and legs reddish. Wings paler than those of the female; veins and stigma yellow.

Forel based this variety on specimens from Alberta. I have seen a large number of individuals from the following localities:

Alberta: Field, Vermillion Pass and Lake Louise, cotypes (Whymper); Red Deer: Banff (J. C. Bradley).

Alaska: (Dall); Kasloff Lake, Kenai Peninsula (Berlin Mus.); Koyukuk (W. J. Peters).

British Columbia: Goldstream to Downie Creek, Selkirk Mts. (J. C. Bradley); Golden (W. Wenman); Carbonate River, Moraine Lake, Valley of Ten Peaks, Hector and Emerald Lake (J. C. Bradley).

Saskatchewan: Methy Lake (Kennicott); Farewell (V. A. Armstrong).

Vancouver I.: (U. S. Nat. Mus.).

Quebec: James Bay and Rupert House (Alanson Skinner); Saguenay River (Engelhardt); Montmorency; Amherst Island and Anticosti Island (Samuel Henshaw).

Ontario: Moose Factory (Alanson Skinner); Rat Portage (J. C. Bradley).

Labrador: (A. S. Packard); Cape Charles.

New Brunswick: St. John (Mus. Comp. Zool.).

Newfoundland: East Coast; Cod Roy (L. P. Gratacap).

Nova Scotia: Digby (John Russell); Ship Harbor (Samuel Henshaw).

Oregon: Umatilla (Samuel Henshaw).

Washington: Brinnon, Hoods Canal (J. C. Bradley); Wenass and Spokane (Samuel Henshaw).

Idaho: Moscow (J. M. Aldrich).

Wyoming: Douglas; Laramie (U. S. Nat. Mus.); Carbonate (Wortmann).

Colorado: Pike's Peak, 10,500 ft. (Wheeler); Pike's Peak, half-way house (T. D. A. Cockerell); Cripple Creek, 10,200 ft., Cascade; Florissant, 8500 ft., and Williams Canyon, Manitou, 8000 ft. (Wheeler); Eldora, 8600 ft., and Ward, 9000 ft. (T. D. A. Cockerell); Ft. Collins (E. G. Titus).

New Mexico: Cloudercroft (H. Skinner); Beulah, 8000 ft., and Pecos (T. D. A. Cockerell); Barela Mesa (Miss A. Gohrman); Manzanares (Miss M. Cooper).

Michigan: Isle Royale and Porcupine Mts. (O. McCreary and C. C. Adams); Marquette (M. Downing).

Wisconsin: White Fish Bay, near Milwaukee, in tamarack bog (Wheeler).

Maine: Reeds Isle, Penobscot Bay (A. C. Burrill); South Harpswell (Wheeler); Heald Pond, near Jackman (F. A. Jones).

Vermont: Jay Peak summit, 4018 ft.

New Hampshire: Mt. Washington, 3840 ft. (W. Reiff).

Pennsylvania: St. Vincent (Jerome Schmitt).

I have followed Forel and Emery in placing under the var. *whymperi* all the American ants which were formerly regarded as belonging to the

typical *C. herculeanus* of boreal and alpine Europe, but I must admit that the differences which, according to Forel, separate the two forms are very slight, not to say elusive. These differences are merely a somewhat coarser sculpture and slightly longer and more abundant, oblique or sub-erect hairs on the antennal scapes and tibiae in the American specimens. After carefully comparing a couple of the cotypes of *whymperi* kindly given me by Professor Forel with many specimens of *C. herculeanus* collected by myself during two summers in the high Alps, I have some doubts as to the validity of *whymperi* as a true variety. Moreover, the specimens I have examined from Newfoundland and Isle Royale, Michigan, have the hairs on the scapes and tibiae neither longer nor more erect than in European specimens and the differences in sculpture are to me imperceptible. Forel states that the female of *whymperi* measures only 12–13.5 mm. and is therefore smaller than that of the typical *herculeanus*, but I have before me a number of females from British America and the Rocky Mts. which measure 15–16 mm. Emery states that the var. *whymperi* occurs also in Siberia and Mongolia and has therefore included it in the palearctic fauna.

The list of localities given above shows that the true home of *C. whymperi* is British America, Alaska and high elevations in the Rocky Mts. (8000 ft. and over) and White Mts. (3000 ft. and over). When it strays to lower levels, it is found only in cold tamarack bogs (in Wisconsin), coniferous forests (in Maine, Michigan, Oregon and Washington) or in the cold woods of the Alleghanies (in Pennsylvania). It is therefore quite as clearly a boreal or alpine form in America as is the typical *herculeanus* in Europe. Its habits, too, are the same. It forms large colonies nesting in logs and stumps, especially of conifers, and may be regarded as the prototype of our various North American "carpenter ants."

27. *C. herculeanus* L. var. *modoc* nom. nov.

C. pennsylvanicus var. *semipunctatus*. FOREL (nec Kirby), Bull. Soc. Nat., XVI, p. 57, 1881; Ann. Soc. Ent. Belg., XLVIII, p. 152, 1904.

Worker major and minor.

Differing from *whymperi* in sculpture, pilosity and color. The shagreening of the head is coarser, so that it is even more opaque, especially on the sides and posterior corners. The punctures of the gaster are larger and the whole surface rougher and more opaque. Hairs and pubescence golden yellow, the former much as in *whymperi*, except that they are shorter and more appressed on the scapes and tibiae. The pubescence is much longer and more conspicuous, especially on the upper surface of the gaster, but decidedly shorter than in *pennsylvanicus*. Head, thorax, petiole and gaster black; legs deep red. Coxæ dark brown; antennæ varying from black to dark brown, the funiculus usually

somewhat paler than the scape. In the worker media and minor, the mandibles may be tinged with red.

Female.

Closely resembling the worker major in sculpture, color and pilosity. The thorax differs from that of the female *whymperi* in being opaque and densely shagreened, except the scutellum and metanotum, which are smooth and shining. In some specimens, the mesonotum is subopaque, but not as smooth as in *whymperi*.

Male.

Indistinguishable from the male of *whymperi*.

Described from numerous specimens from the following localities:

California: King's River Canyon (H. Heath); Marin County, Fallenleaf Lake, Giant Forest and Alta Meadow Trail (J. C. Bradley); Sierra Nevada (Amer. Mus. Nat. Hist.); Tahoe City (A. Fenyes).

Washington: Umatilla and Klikitat Valley (Samuel Henshaw); Pullman (C. V. Piper); Olympia and Seattle (T. Kincaid); San Juan Island (W. M. Mann); Union City (J. C. Bradley).

Oregon: Corvallis (Amer. Mus. Nat. Hist.).

Nevada: (Amer. Mus. Nat. Hist.).

Idaho: (R. W. Doane); Moscow (J. M. Aldrich).

Colorado: Boulder Canyon (T. D. A. Cockerell).

New Mexico: Upper Ruidoso, 8500 ft. (C. H. T. Townsend); Harvey's Ranch, Las Vegas Range, 9600 ft. (Miss Ruth Reynolds); same range, 10,000 ft. (E. L. Hewitt); James Canyon, near Clouderoft (A. G. Ruthven).

Utah: Little Willow Canyon (R. V. Chamberlin).

South Dakota: Black Hills (Amer. Mus. of Nat. Hist.).

British Columbia: Alert Bay (H. I. Smith).

I would regard California as the type locality of this form, which seems to be rather constant. The specimens from Utah and South Dakota have paler and somewhat longer pubescence and therefore form a transition to *pennsylvanicus*. All of my specimens, however, show that there is little difficulty in separating this form from *whymperi*. In the northern and western portion of its range, it seems to descend to lower levels than this form, but in the mountains of New Mexico it seems to occur in the same stations.

I do not believe that this is the form described by Kirby as *semipunctatus*. Kirby's description, which evidently refers to a female specimen, is quite worthless. That it refers either to *whymperi* or *pennsylvanicus* seems to be proved by the locality. He says that the specimen was "taken on a journey from New York to Cumberland House." Now

Cumberland House is in Keewatin, and in the region through which he traveled to reach that point, he could only have happened on *whymperi* or *pennsylvanicus*, and as most of his journey lay through British America, it is more probable that he had a specimen of *whymperi*. I believe therefore that Forel is mistaken both in attributing the western form of *herculeanus* above described to *semipunctatus* and in placing it under *pennsylvanicus*. It is clearly more nearly related to *whymperi* and the typical *herculeanus* of Europe.

28. *C. herculeanus pennsylvanicus* De Geer

Formica Pennsylvanica DE GEER, Mém. Serv. Hist. Insect., III, p. 603, No. 4, Pl. 31, Figs. 9-10, ♀ ♀ ♂, 1773; GÖZE, DE GEER, Abh. Gesch. Ins., III, p. 391, No. 4, Pl. 31, Figs. 9-10, ♀ ♀ ♂, 1780; RETZIUS, Gen. et Spec. Insect., p. 75, No. 332, 1783; OLIVIER, Encycl. Method. Insect., VI, p. 501, No. 52, 1791; LATREILLE, Hist. Nat. Fourmis, p. 99, Pl. 2, Fig. 3, 1802; LEPELETIER, Hist. Nat. Ins. Hymen., I, p. 213, No. 14, ♀ ♀, 1836; BUCKLEY, Proc. Entom. Soc. Phila., VI, p. 155, ♀ ♀, 1866; PROVANCHER, Natur. Canad., XII, p. 355, No. 2, ♀ ♀, 1881; Faune Ent. Canad. Hymén., p. 598, No. 2, ♀ ♀ ♂, 1883; McCook, Trans. Amer. Ent. Soc., V, p. 277-289, Pl. 2-4, 1876.

? *Formica semipunctata* W. KIRBY, Fauna Bor. Amer., IV, p. 262, No. 362, ♀, 1837.

Formica caryæ FITCH, Trans. N. Y. State Agri. Soc., XIV, p. 151, ♀ ♀ ♂, 1854.

Camponotus pennsylvanicus MAYR, Verh. Zool. bot. Ges. Wien, XII, p. 666, No. 24, ♀ ♀, 1862; McCook, Proc. Acad. Nat. Sci. Phila., 1878, p. 15-19; Ann. Mag. Nat. Hist., (5) XIII, p. 419, 1884; *Ibid.*, p. 140, 1879; ERN. ANDRÉ, Spéc. Hymen. Europe, II, Pt. 13, p. 141, 1882; *Ibid.*, Pt. 14, p. 153, No. 3, ♀ ♀, 1882; DALLA TORRE, Catalog. Hymen., VII, p. 246, 1893.

C. herculeanus race *pennsylvanicus* FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, P. 81, p. 57, 1879.

C. herculeanus var. *pennsylvanicus* MAYR, Verh. Zool. bot. Ges. Wien, XXXVI, p. 420, 1886.

C. herculeanus subsp. *pennsylvanicus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 675, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XXI, p. 402, 1905; Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 23, 1906.

Worker major and minor.

Differing from the preceding forms of *herculeanus* in sculpture, pilosity and color. The head and thorax are somewhat less coarsely shagreened and appear therefore more shining. This is especially true of the sides and posterior corners of the head. The gaster is opaque and very coarsely shagreened, with the punctures that bear the pubescence larger and more transversely elongated. The hairs and pubescence are more abundant and longer than in *whymperi* and *modoc* and of a pale yellow or white color. On the gaster, the pubescence is extremely long and takes the form of dense, appressed hairs which conceal the ground surface and give this region of the body an ashy tint and silky luster. In what may be regarded as the typical form of the subspecies, the

body, including the posterior margins of the gastric segments is black throughout, with only the antennal funiculi, tarsi and articulations of the legs dark brown or reddish. In many major workers, however, and especially in minor workers, the mandibles, antennal scapes, legs, pleuræ and petiole may vary from very deep to pale red.

Female.

Resembling the worker major, but the whole thorax and gaster are more shining, as in the female *whymperi*; hairs and pubescence shorter than in the worker major, especially on the gaster, which has the pubescence only a little longer and denser than in *whymperi*.

Male.

Indistinguishable from the male of *whymperi*; black throughout, with only the antennal funiculi and tarsi brown. Wings often as deeply tinged with brown as in the female.

I have examined many specimens of this well-known ant from the following localities:

Pennsylvania: North Mts., Bartram's Park, Philadelphia and Lehigh Water Gap (C. Daecke).

New York: Saranac Lake, Big Moose, Oswego, Nassau, Cedar Hill and Keene Valley (N. Y. State Coll.); Ithaca (Cornell Univ. Coll.); Garrison-on-Hudson (T. D. A. Cockerell); Bronxville and Cold Spring Harbor, L. I. (Wheeler); Bergen Beach (G. von Krockow); West Farms (J. Angus); Staten Island (W. T. Davis); Turin (Lucy Armstrong).

New Jersey: Caldwell (E. T. Cresson); Riverton (H. Viereck); Medford and Westville (Phila. Acad. Coll.); North Woodbury and Delair (C. Daecke); Newfoundland (W. T. Davis); Halifax and Fort Lee (Wheeler).

Maine: Mt. Katabdin (Hamlin); Bethel (Mus. Comp. Zool.).

New Hampshire: Canobie Lake (G. B. King); Exeter (Mus. Comp. Zool.).

Vermont: Jay Peak (A. P. Morse).

Massachusetts: Sherborn, Natick, Winchendon, Palmer, Needham, Wellesley and West Roxbury (A. P. Morse); Worcester, Haverhill, Cambridge and Brookline (Mus. Comp. Zool.); Boston and Blue Hills (Wheeler); Springfield and Essex County (G. B. King); Milton (Bost. Soc. Nat. Hist.); Warwick (Miss Edmunds); Woods Hole (Miss A. Fielde).

Connecticut: Woodmont (Butrick); New Haven and Branford (W. E. Britton); Colebrook (Wheeler).

Maryland: Chestertown and Pomona (H. Viereck); Washington, D. C. (W. V. Warner).

Virginia: Ashland (J. F. McClendon).

North Carolina: Black Mts. (W. Beutenmueller); Lake Toxaway (Mrs. A. T. Slosson).

Georgia: Clayton, 2000-2700 ft. (W. T. Davis).

North Dakota: Ellison (Miller).

South Dakota: Medicine Root, Pine Ridge Ind. Res. (Thompson).

Wisconsin: Milwaukee (Wheeler).

Michigan: Battle Creek.

Illinois: Urbana (Pricer); Mossville (F. Blake); Algonquin (W. A. Nason); Rockford (Wheeler).

Indiana: Arlington and De Long (W. S. Blatchley).

Tennessee: Springdale (C. C. Adams).

Missouri: St. Louis (C. F. Baker).

Kansas: Ottawa (E. G. Titus).

Arkansas: Fort Smith (A. W. Morrill).

Oklahoma: Ponca City (A. C. Burrill).

Texas: Austin (Wheeler); Meridian and Beaumont (W. H. Long); Brownwood (J. C. Crawford); Joaquin, Longview and Lovelady (W. W. Yothers and E. S. Tucker); Victoria (J. D. Mitchell); Calvert (C. R. Jones); Dallas (W. D. Hunter and F. C. Pratt); Palestine (F. C. Bishopp).

Louisiana: Logansport (W. D. Pierce); Shreveport and East Point (F. C. Bishopp); Baton Rouge (W. Newell); Mansfield (W. D. Hunter); Orange (R. C. Howell); Natchoches (Cushman and Pierce).

Ontario: Toronto (R. J. Crew).

Quebec: Montreal (T. D. A. Cockerell).

Worker specimens from St. Louis, Missouri, and from some of the Texas localities, notably from the vicinity of Austin, have a peculiar brown tinge to the body, and the legs and antennæ are much paler than in the typical form of the subspecies, but I have not deemed it advisable to separate them as an independent variety.

From the foregoing list of localities, which might be very easily increased, it will be seen that *C. pennsylvanicus* ranges over southern Canada and the states as far west as Victoria, Texas, and the Pine Ridge Indian Reservation in South Dakota. Unlike *whymperi* and *modoc* it is a lowland form. It is far and away the most abundant *Camponotus* in the North Atlantic states and Middle West, showing a range of adaptability to differences in temperature and humidity second only to that of *Lasius americanus* and *Formica subserica*. On this account, it is the only one of our *Camponoti* that has attracted general attention. It is commonly found nesting in old logs and stumps or in the dead wood of standing trees, but occasionally it nests in old houses. In such places it

may do considerable damage by tunneling in beams and rafters and may become a domestic nuisance by visiting the sweet food-stuffs in kitchens and pantries. Its habits were first studied by McCook. Recently Pricer and Miss Edith Buckingham have made many interesting observations on its polymorphism and behavior.

29. *C. herculeanus pennsylvanicus* var. *mahican* nom. nov.

C. herculeano-pennsylvanicus FOREL, Bull. Soc. Vaud. Sci. Nat., XVI, P. 81, p. 57, ♀, 1879.

C. herculeanus var. *herculeano-pennsylvanicus* EMERY, Mem. R. Acad. Sci. Ist. Bologna, p. 770, 1896.

Worker major and minor.

Differing from the typical *pennsylvanicus* only in pilosity and color. The hairs and pubescence are pale yellow as in *pennsylvanicus*, but the pubescence on the gaster is shorter and sparser, though longer than in *modoc*. The legs and petiole are red and the thorax is more or less tinged with the same color, at least on the pleurae. Posterior borders of gastric segments dull yellow. On the whole, this variety seems to be intermediate between *ichymperi* and *pennsylvanicus*.

Described from a number of workers taken in the following localities: Massachusetts: Cambridge (Mus. Comp. Zool.); Woods Hole (Wheeler).

New Jersey: Englewood (Wheeler).

Forel mentions this form also from the Alleghanies, New York, Illinois and South Carolina.

I have attached this variety to *pennsylvanicus*, because it shows a greater affinity to this form than to the true *herculeanus*, and I have ventured to give it a new name, because the one by which it has been known is not properly a varietal name and is very unwieldy. Whether this form is worthy of recognition as an independent variety cannot be decided without more material than I have been able to examine.

30. *C. herculeanus pennsylvanicus* var. *ferrugineus* Fabr.

Formica ferruginea FABRICIUS, Suppl. Entom. Syst., p. 279, No. 11-12. ♀ ♀. 1798; LATREILLE, Hist. Nat. Fourm., p. 94, 1802; FABRICIUS, Syst. Piez., p. 399, No. 14, 1804; F. SMITH, Catalog. Hymen. Brit. Mus., VI, p. 53, No. 187, 1858.

Camponotus ferrugineus MAYR, Verh. Zool. bot. Ges. Wien, XIII, p. 399, 1863.

C. pennsylvanicus var. *ferrugineus* FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, P. 81, p. 56, 1879; EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 668, 1893; DALLA TORRE, Catalog. Hymen., VII, p. 247, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XXI, p. 402, 1905; Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 23, 1906.

Worker major and minor.

Closely resembling the typical *pennsylvanicus* in sculpture and in the length and abundance of the hairs and pubescence, but differing in color. The hairs and pubescence are bright golden yellow instead of pale yellow or white. Thorax, petiole, coxæ, femora and base of first gastric segment yellowish ferruginous; pronotum and often also the mesonotum black. Antennal scapes black, with yellow tips and insertions; funiculi, mandibles, anterior border of head, tibiæ and tarsi deep red; posterior margins of gastric segments yellow.

Female.

Resembling the worker. Pronotum, mesonotum, except its anterior portion, scutellum and metanotum black. Remainder of thorax, base and sometimes the whole of the first and the base of the second segment yellowish red. Wings rich yellowish brown with resin-yellow veins and stigma. Hairs and pubescence golden yellow, shorter than in the worker, especially on the gaster.

Male.

Differing from the male of *pennsylvanicus* in having the whole of the antennæ and legs, and sometimes also the metasterna, coxæ and ventral portion of the petiole, red or brown. Edges of gastric segments dull yellow. The whole body is densely and coarsely shagreened and the gaster is somewhat more opaque than in *pennsylvanicus*.

Described from numerous specimens taken in the following localities:

Massachusetts: Sherborn (A. P. Morse); Medford (Mus. Comp. Zool.); Boston (Wheeler).

Connecticut: New Haven (Moore and Viereck); Orange and New Canaan (W. E. Britton).

New York: West Farms (J. Angus); Mosholu and Bronxville (Wheeler); Forest Park (G. v. Krockow); Staten Island (W. T. Davis).

New Jersey: Delair (C. Daecke); Camden and Boonton (H. Viereck); Westville (Phila. Acad. Sci.); Fort Lee and Great Notch (Wheeler); Ocean County.

Maryland: Pomona (H. Viereck).

Pennsylvania: Lawndale.

Indiana: Mitchell (W. S. Blatchley).

Illinois: Rockford (Wheeler); Mossville (F. Blake); Urbana (Pricer).

This variety has a much more limited range than *pennsylvanicus*, since it does not extend as far south or north, and seems to be confined to rather low, warm woodlands. It varies so little that it might be regarded as a subspecies. I have been unable to find any specimens that would represent transitions between *ferrugineus* and any of the other forms of *herculeanus*. In certain respects it resembles the Japanese subspecies *obscuripes* Mayr, but this form has much darker legs and in sculpture and pilosity is much like *ligniperda*.

31. *C. herculeanus ligniperda* Latreille var. *noveboracensis* Fitch

Formica noveboracensis FITCH, Trans. N. Y. State Agri. Soc., XIV, p. 52, ♀, 1854.

Camponotus herculeanus race *ligniperdus* var. *pictus* FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, P. 81, p. 59, ♀ ♀ ♂, 1879; Ann. Soc. Ent. Belg., XXX, p. 141, ♀ ♀, 1886.

C. herculeanus subsp. *ligniperdus* var. *pictus* EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 674, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XXI, p. 402, 1905.

C. ligniperda var. *pictus* DALLA TORRE, Catalog. Hymen., VII, p. 240, 1893.

C. herculeanus race *ligniperdus* var. *noveboracensis* FOREL, Ann. Soc. Ent. Belg., XLIII, p. 447, 1899.

C. herculeanus ligniperdus var. *noveboracensis* WHEELER, Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 23, 1907.

Worker major and minor.

Sculpture finer and more superficial than in *whymperi* and *pennsylvanicus*, so that the whole surface of the body and especially the gaster is smoother and more shining. Hairs and pubescence pale yellow or white, sparse and short; the pubescence on the gaster being nearly as short as in *whymperi* and decidedly more dilate; the minute hairs on the scapes and legs more appressed. Head, antennæ and gaster black; thorax, petiole and legs red, the tibiæ and tarsi often somewhat darker. Posterior edges of gastric segments yellowish. In the worker media and minima, the mandibles and sometimes also the clypeus are red.

Female.

Resembling the worker major, but the thorax and gaster very smooth and shining; the latter with shorter hairs and very short and dilute pubescence. Dorsal portion of pronotum, scutellum, metanotum and three more or less distinct longitudinal bands on the mesonotum, black. In some specimens, the whole mesonotum and dorsal portion of the epinotum are black. Extreme base of first gastric segment often red or yellow. In other respects, the color is like that of the worker. Wings strongly tinged with yellowish brown; veins and stigma yellow.

Male.

Indistinguishable from the male of *pennsylvanicus*. Wings somewhat paler than in the female.

Of this variety I have examined specimens from the following localities:

Nova Scotia: Digby (J. Russell); Bedford (W. Reiff).

Maine: West Beach (Mus. Comp. Zool.); South Harpswell (Wheeler).

New Hampshire: Mt. Washington, summit (Mrs. A. T. Slosson and C. S. Bacon); White Mts. (W. F. Fiske); Canobie Lake (G. B. King); Exeter (Mus. Comp. Zool.); Pelham (Bridwell); Hanover (C. M. Weed); Durham.

Vermont: Jay Peak (A. P. Morse).

Massachusetts: Winchendon, Wellesley, Needham and Sherborn (A. P. Morse); Malden, Warwick, Cambridge, Medford and Eastport (Mus. Comp. Zool.); Essex County and Mt. Tom (G. B. King); Lynn (Davis); Boston and Woods Hole (Wheeler).

Rhode Island: Providence (Davis).

Connecticut: New Hartford and Orange (W. E. Britton); Colebrook (Wheeler).

New York: Ithaca (Cornell Univ. Coll.); Keene Valley, Essex County, Oswego, Elizabeth, Karner, Cedar Hill and Saranac Lake (N. Y. State Coll.); Boonville (E. G. Titus).

Pennsylvania: White Haven (J. C. Bradley); North Mts.

Indiana: Pine (W. S. Blatchley).

Michigan: Ann Arbor (J. Dawson).

Illinois: Rockford (Wheeler); Algonquin (W. A. Nason).

Wisconsin: Milwaukee County (Wheeler).

Colorado: Williams Canyon, Manitou (Wheeler).

Washington: Union City (J. C. Bradley).

Oregon: (Amer. Mus. Nat. Hist.).

Although *C. noveboracensis* ranges across the continent from the Atlantic to the Pacific, it is not known to occur further south than Maryland or further north than Nova Scotia. In the Atlantic states, it lives by preference in hilly country, usually at higher elevations than *pennsylvanicus* and *ferrugineus*. To judge from the specimens before me, *noveboracensis* exhibits very little variation in color. The specimens from Washington, however, have the coarse opaque surface of *whymperi* and may be regarded as transitions to this variety.

32. *C. herculeanus ligniperda* var. *rubens* Wheeler

C. herculeanus ligniperda var. *rubens* WHEELER, Psyche, p. 41, ♀ ♂, 1906; Occas. Papers Bost. Soc. Nat. Hist., VII, 7, p. 24, 1906.

This variety differs from *noveboracensis* in having all the gastric segments of the female deep red, except their posterior margins, which are black. The male is indistinguishable from the male of *noveboracensis*. The worker forms are unknown.

Described from two females from Norway, Maine (S. J. Smith): one male and one female from Bethel, Maine (A. M. Edwards) and four females taken in Michigan (Clark).

It is somewhat doubtful whether this form can be maintained as an independent variety. Reëxamination of the type specimens shows that they are very old, and the red color of the gaster in the female may be due to bleaching.

IV. *Fallax* Group

As I have recently published the synonymy and descriptions of the twelve North American subspecies and varieties of *C. fallax* Nyl., which is the type of this group (Journ. N. Y. Ent. Soc., XVIII, No. 4, 1910), I shall here confine myself to listing the various forms, with the states in which they are known to occur.

33. *Camponotus fallax* Nyl. var. *nearcticus* Emery

New York; New Jersey; Pennsylvania; Connecticut; Massachusetts; Rhode Island; Illinois; Wisconsin; Nebraska; Washington; Idaho; Oregon; California; Florida; Texas; Canada.

34. *C. fallax* var. *minutus* Emery

New Jersey; New York; Pennsylvania; Massachusetts; Illinois; Canada; Vancouver.

35. *C. fallax* var. *pardus* Wheeler

New York; New Jersey.

36. *C. fallax* var. *tanquaryi* Wheeler

Illinois.

37. *C. fallax* var. *decipiens* Emery

Indiana; Kansas; Colorado; Utah.

38. *C. fallax rasilis* Wheeler

Texas; Arizona; Louisiana; Florida.

39. *C. fallax rasilis* var. *pavidus* Wheeler

Texas; Louisiana; Florida.

40. *C. fallax subbarbatus* Emery

Maryland; Virginia; New Jersey; Illinois; California.

41. *C. fallax subbarbatus* var. *paucipilis* Emery

Maryland.

42. *C. fallax discolor* Buckley

Texas; Oklahoma; Missouri; Illinois.

43. *C. fallax discolor* var. *clarithorax* Emery

California; Illinois; Pennsylvania.

44. *C. fallax discolor* var. *cnemidatus* Emery

Maryland.

45. *C. sayi* Emery

EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 679, Pl. 22, Figs. 27, 28, ♂, 1893.

Worker major. Length, 7-8 mm.; head, 2.5 x 2.4 mm.; scape, 1.7 mm.; hind tibia, 2 mm.

Head large, but little longer than broad, broader behind than in front, with broadly excised posterior margin and prominent posterior corners. Eyes moderately large, feebly convex. Mandibles 5-toothed, convex. Clypeus with very short lateral limbs and subrectangular median portion, which is slightly convex but not carinate, with depressed border and small median notch. Frontal carinae lyrate, rather far apart. Frontal area subtriangular, broader than long. Frontal groove distinct. Antennal scapes short, not reaching the posterior corners of the head, slender and terete at the base, somewhat thickened distally. Thorax stout and short, narrower than the head, robust in front, narrowed and laterally compressed behind; pro- and mesonotum flattened, in profile moderately arcuate; epinotum with subequal base and declivity meeting to form a distinct though obtuse angle. Petiole high and rather narrow, compressed anteroposteriorly, with convex anterior and flattened posterior surface, its margin entire and rather acute. Legs short, femora stout.

Head and thorax shining, very finely shagreened; cheeks and front with small, round, scattered punctures. Mandibles more coarsely punctate. Gula, sides and posterior corners of head glabrous. Gaster very finely, transversely shagreened, with small, scattered, piligerous punctures, its surface even more shining than the head and thorax.

Hairs white or pale yellow, erect, very sparse; present in a transverse row on the epinotal angle, margin of petiole and in two rows on each gastric segment, one across the middle and the other along the posterior edge. Legs and scapes naked. Pubescence extremely short and dilute, even on the gaster.

Head, antennae, thorax and legs yellowish red; the head slightly darker; gaster black, with the posterior borders of the segments yellow.

Worker minor. Length, 4.5-6 mm.

Head proportionally longer than in the worker major, with straight and more nearly parallel sides, straight posterior border and rounded posterior corners. Clypeus more convex in front, but not carinate, its anterior border with a minute median notch. Mandibles less convex, eyes more convex than in the worker major. Antennal scapes extending about one-third their length beyond the posterior corners of the head. Thorax less robust; petiole with blunt border.

In sculpture, color and pilosity much like the worker major; head more shining and without small, scattered punctures on the sides and front.

Arizona: Phœnix, cotypes (Th. Pergande); Phœnix and Prescott, running on trunks of cotton-wood trees (Wheeler).

This species, as Emery has remarked, is very similar to *C. fallax discolor*. It is even more like *fallax rasilis*, but the head and thorax are more robust, the head is more excised behind, the clypeal notch smaller, the epinotum more angular and the sculpture is different, the punctures on the sides and front of the head being much smaller and the surface of the head and thorax somewhat more shining. These differences, however, are not very pronounced and it may be necessary, when *sayi* is better known, to reduce it to the rank of a subspecies of *fallax*.

46. *C. texanus* Wheeler

As I have published a detailed description of all four phases of this handsome species (Psyche, 1903, p. 108), it may be passed over here with a few remarks. It is readily distinguished from all the other members of the *fallax* group by its large size (worker major 10–12 mm.), and coloration, the worker major having a black head and gaster, red thorax and legs, a yellow base to the first gastric segment and dark red antennæ. The male differs from all the known males of the *fallax* group in the color of the thorax and legs, which are reddish yellow, with the scutellum, metanotum and three spots on the mesonotum black and the epinotum more or less infuscated.

The types are from Travis County, Texas, and were found nesting in oak logs.

47. *C. schaefferi* Wheeler

The female and worker phases of this species have been described in detail in Journ. N. Y. Ent. Soc., XVII, p. 88, 1909. The worker major is as large as that of *texanus* and measures 9–12 mm., but it is yellowish red throughout with darker mandibles, scapes and anterior border of the head. The mandibles are distinctly flattened distally, and the anterior border of the clypeus is flat and has a broader, shallower notch than in *sayi* and *texanus*, with a small tooth on each side. In these characters and in the sculpture of the head, there is an unmistakable resemblance to the smoother forms of *herculeanus*, such as *ligniperda*. The middle and hind tibiæ have two rows of stiff, graduated bristles on the distal half of their flexor surface. In *texanus*, these bristles are smaller and less numerous and seem to be rather inconstant; in *sayi*, they are lacking. In the worker minor and female of *schaefferi*, which are colored like the worker major, the median excision of the clypeal border is still shallower and even more like that of *herculeanus* and *lavigatus*. The wings of the

female are deeply tinged with brown and have resin-yellow veins and stigma. The male is unknown.

The types are from southern Arizona and comprise a media and a minima worker taken by Mr. C. Schaffer at Palmerlee, Cochise County, Ariz., a winged female taken by Mr. E. J. Osler in the Huachuca Mts. and a long series of females and workers of all sizes taken by Mr. C. R. Biederman in Carr Canyon in the same mountain range from a "nest partly in the ground and partly in rotten wood, six inches deep, at an altitude of 5000 ft."

48. *C. hyatti* Emery

EMERY, Zool. Jahrb. Abth. f. Syst., VII, p. 680, Pl. 22, Figs. 25, 26, ♂, 1893.

"*Worker*. Closely allied to *C. marginatus* [*C. fallax*], but the head with more shining and more nearly parallel sides; posterior corners less rounded, mandibles shining; thorax impressed in the region of the meso-epinotal suture; epinotum with the convex base and concave declivity meeting to form an obtuse angle. Piceous black; mouth, pronotum and legs more or less ferruginous or red. Abdomen black. Length, 3.5-6.5 mm.

"Head of the worker maxima, 1.9 x 1.8 mm.; scape, 1.2 mm.; hind femur, 1.7 mm.; thorax, 2 x 1.3 mm.

"From San Jacinto, California; collected by Mr. Ed. Hyatt; received from Mr. Pergande.

"In habitus very similar to *C. marginatus*; body more thickset. The head in the worker major has more nearly parallel, less convex sides, more concavely excised posterior border, more prominent anterior and posterior corners, the latter being less broadly rounded. In the worker minor the head is somewhat broader than in the minor worker of the same size, the anterior corners somewhat more rounded. The sculpture is very similar to that of the typical *marginatus*, but much more superficial; the impressed punctures much shallower, scarcely visible on the clypeus, smaller on the cheeks; the integument is therefore much more shining. The mandibles are less prominent than in *marginatus*, with more convex outer borders, also 5-toothed, shining, sparsely punctate. The clypeus also has a very short, rounded lobe, with anterior border strongly emarginate in the middle; flat in the worker major, bluntly roof-shaped in the minor. The lobe is less conspicuous in the large worker, owing to the more prominent anterior corners of the head. The thorax is proportionally broader than in *marginatus*, in profile distinctly constricted between the meso- and epinotum; the somewhat convex basal and the distinctly concave declivous surface form together a rounded angle. Seen from above, the pronotum is especially broad and rounded on the sides; the mesonotum is strongly narrowed posteriorly to the mesoepinotal suture, where the thorax is narrowest; the sides of the epinotum are nearly parallel. The petiolar scale is somewhat broader and thinner than in *marginatus*, its upper margin broadly arched and rather sharp. The sculpture of the thorax and gaster are as in *marginatus*, and the same is true of the pilosity of the whole body.

"The color is variable; usually pitch black; mouth, gula and tibiae somewhat reddish; prothorax, coxae, femora and tarsi light red; gaster black, with red-

dish yellow margins to the segments. Often, especially in minor workers, the pale color is more extensive and the whole insect may be ferruginous red with brownish black gaster."

As I possess only a few small workers (cotypes from Mr. Pergande) of this species, I have translated Emery's original description.

49. *C. hyatti* Emery var. *bakeri* Wheeler

WHEELER, Bull. Amer. Mus. Nat. Hist., XX, p. 271, ♀ ♀, 1904.

Worker media. Length, 5.5 mm.

Differing from the typical form in coloration, which is like that of *C. fallax* var. *discolor*, except that the basal two-thirds of the first gastric segment are red, like the head, thorax and appendages. The sculpture is quite as sharp as in *fallax*, and the surfaces of the head and body are quite opaque. The mandibles and cheeks are coarsely punctate. In profile, the thorax is like that of the typical *hyatti*, except that the basal surface of the epinotum has a transverse impression behind.

Female. Length, 7.5–8 mm.

Resembling the female of *C. fallax* var. *discolor*. Head longer than broad, with nearly straight posterior border and prominent posterior angles; cheeks converging in front, distinctly concave. Mandibles 5-toothed. Whole body more shining than in *discolor*, though it is throughout distinctly shagreened. Mandibles, cheeks and front coarsely punctate. Body and appendages yellowish red, teeth of mandibles, anterior border of cheeks and clypeus, scutellum, metanotum, a narrow band across the posterior portions of the first and second gastric segments and the remainder of the gaster, black. Posterior edges of all the gastric segments yellow. There is a more or less distinct brown cloud on the anteromedian and in one specimen also on the lateral surface of the mesonotum. Wings yellowish gray, with brownish yellow veins.

Described from two mediæ and two female specimens taken by Prof. C. F. Baker on Catalina Island, California.

V. *Senex* Group

50. *Camponotus mina zuni* subsp. nov.

Worker major. Length, 6.5–7 mm.

Head rather small, subrectangular, a little longer than broad and a little broader behind than in front, with slightly excised posterior and feebly convex lateral borders. Eyes rather large, slightly convex. Mandibles 5-toothed, with convex external borders and upper surfaces. Clypeus distinctly carinate, very slightly produced anteriorly as a broadly rounded lobe, with a faint median sinus. Frontal area distinct, triangular, as long as broad. Frontal carinæ strongly lyrate, approximated anteriorly, twice as far apart behind as in front. Frontal groove distinct. Antennæ short; scapes slender and terete at the base, somewhat enlarged towards their tips, which do not extend beyond

the posterior corners of the head. Thorax narrower than the head, broader in front than behind, scarcely compressed laterally, in profile feebly arcuate above, the pro- and mesonotum and base of the epinotum subequal, flattened, separated by pronounced sutures; the base of the epinotum somewhat longer than the sloping, straight declivity with which it forms an obtuse angle. Petiole rather high, in profile convex in front, flattened behind, with rather blunt border; seen from behind, narrow below, expanded above, with broadly rounded upper border, feebly notched in the middle. Gaster of the usual shape. Legs rather short, with stout femora; tibiæ without rows of bristles on their flexor surfaces.

Mandibles lustrous or somewhat shining, very finely striated, with scattered, coarse punctures towards their inner borders. Head, thorax and antennæ opaque or subopaque, finely and densely punctate. Cheeks and clypeus also with scattered, somewhat elongated, piligerous foveolæ. Petiole, gaster and legs more shining, rather coarsely and transversely shagreened, with scattered piligerous punctures.

Hairs on the body rather abundant, delicate, short, erect and sordid white; absent on the sides and posterior corners of the head, short and obtuse on the clypeus and cheeks; absent on the scapes, except at their tips. Legs with very short, sparse, oblique hairs; femora with a row of long, erect hairs on their flexor surfaces. Pubescence extremely short and sparse, visible only on the antennal scapes, posterior portion of the head and basal gastric segment.

Color black; mandibles, clypeus, cheeks, antennæ, tibiæ, tarsi and tips of femora ferruginous or dark red.

Worker minor. Length, 4-5 mm.

Head resembles that of the worker major, but is smaller, with straighter sides, more converging anteriorly. Eyes more convex. Antennal scapes reaching about one-third their length beyond the posterior corners of the head. Like the worker major in sculpture, pilosity and color, except that the red coloration of the head is confined to its anterior border. There are no foveolæ on the cheeks and clypeus. The hairs on the body are also shorter and less abundant.

Described from numerous specimens taken by myself on the bark of old mesquite (*Prosopis velutina*) trees at Tucson, Arizona.

This subspecies differs from the typical *mina* first described by Forel from Cape St. Lucas at the tip of Lower California and subsequently redescribed from the same locality as *C. erythropus* by Pergande, in the following characters: The clypeus of the worker major is distinctly carinate, the piligerous foveolæ on the cheeks and clypeus are much smaller, shallower and less abundant, the punctures on the gaster are smaller and sparser, there are no erect hairs and long pubescence on the antennal scapes, except at their extreme tips, none on the sides and posterior corners of the head, and the hairs on the thorax, petiole, gaster and legs are much shorter, more delicate and much less abundant. These differences are shown by comparison of *zuni* with two major worker cotypes of

Pergande's *C. erythropus*, which, as Emery has stated, is merely a synonym of Forel's *mina*.

51. *C. planatus* Roger

C. planatus ROGER, Berl. Ent. Zeitschr., VII, p. 148, No. 24, ♀ ♀ ♂, 1863; DALLA TORRE, Catalog. Hymen., VII, p. 248, 1893; FOREL, Biol. Centr. Amer. Hymen., III, p. 141, 1899-1900.

C. senex stirps *planatus* FOREL, Bull. Soc. Vaud. Sci. Nat., (2) XVI, P. 81, p. 97, ♀, 1879; *Ibid.*, (2) XX, P. 91, p. 346, 1884.

C. senex subsp. *planatus* EMERY, Mem. R. Accad. Sci. Ist. Bologna, p. 775, 1896.

Worker major. Length, 5-6 mm.

Head small, as broad as long, a little broader behind than in front, with straight posterior and convex lateral borders and rounded anterior corners. Eyes rather large, moderately convex. Mandibles 6-toothed, with convex outer borders and upper surfaces. Clypeus sharply carinate, broadly rounded in front, with the anterior border feebly sinuate in the middle. Frontal area distinct, subtriangular, much broader than long. Frontal carinae not very strongly lyrate, twice as far apart behind as in front. Frontal groove distinct. Antennae moderately long; scapes terete at the base, slightly enlarged distally, extending to the posterior corners of the head. Thorax short, a little narrower in front than the head, somewhat broader in front than behind, the dorsal surface evenly arcuate in profile, flattened when seen from above and marginate on each side, where it passes over into the somewhat concave, perpendicular pleural surface. Epinotum with subequal base and declivity, the former slightly convex and square, the latter distinctly concave, the two surfaces meeting with a rather sharp transverse margin. Petiole moderately high, compressed anteroposteriorly, with convex anterior, flattened posterior surface and rather sharp margin; seen from behind, narrow below, expanded above, with broadly rounded border, entire or feebly notched in the middle. Gaster of the usual shape. Legs rather short; tibiae without bristles on their flexor surfaces.

Opaque throughout, except the mandibles, which are shining, finely striated and coarsely punctate on their lateral and apical surfaces. Head, thorax and gaster densely punctate; legs coarsely shagreened. Cheeks and clypeus with large but rather shallow, somewhat elongated, scattered foveolæ; gaster with coarse, sparse, piligerous punctures.

Hairs very abundant, erect, glistening white; covering the head, thorax, petiole and gaster, especially dense and conspicuous on the epinotum and gaster. Hairs on the legs somewhat shorter and more oblique; on the antennal scapes still shorter and more appressed. Pubescence on the gaster long and dense; much shorter and more dilute on the head and thorax.

Head, thorax, petiole and legs rather dark ferruginous red; mandibles, cheeks, clypeus and often also the antennae suffused with yellow. Mandibular teeth and gaster black; femora, tibiae and tarsi often infuscated, except at the articulations.

Worker minor. Length, 3.5-4 mm.

Closely resembling the worker major, but the head smaller and with less convex cheeks and the petiole thicker and blunter.

Female. Length, 6.5–8.5 mm.

Resembling the worker major, especially in the shape of the head. Thorax robust and flattened dorsally. Petiole broader and more compressed than in the worker major, its apical margin sharper and with a rather deep and broad median notch. Hairs much shorter and less glistening than in the worker, though abundant and erect. Wings rather short (7 mm.); almost colorless, with pale yellow veins and dark brown stigma.

Male. Length, 4.5–5 mm.

Head slightly longer than broad, with large eyes and ocelli, its posterior border broadly rounded; cheeks subparallel, straight, somewhat shorter than the eyes. Clypeus convex, bluntly carinate, with somewhat projecting, rounded and entire anterior margin. Mandibles edentate. Antennæ very slender, first funicular joint swollen, longer than the second. Thorax robust, with convex, rounded epinotum, without distinct basal and declivous surfaces. Petiole low, thick and transverse, with rather sharp, entire dorsal border. Gaster and legs of the usual conformation.

Whole body subopaque, finely shagreened or punctate.

Pilosity much as in the worker minor, but less abundant. Scapes naked. Cheeks with a few blunt, erect hairs. Hairs on legs short, subappressed, longest and most conspicuous on the gaster. Pubescence apparently absent.

Black; mandibles, mouthparts, tarsi, genitalia and articulations of legs and thorax brownish. Wings like those of the female, but with even paler veins.

Described from numerous specimens of all four phases taken in the following localities:

Florida: Miami, Card's Point and Planter, Key Largo (Wheeler).

Texas: Esperanza Ranch, Brownsville (C. Schaeffer).

This tropical species is widely distributed through Central America, Mexico and Cuba, but enters the United States only at the two points mentioned above, namely, at the southern extremity of Florida and at the mouth of the Rio Grande del Norte. Like the other species of the *senex* group, it forms rather small colonies and is exquisitely arboreal in its habits. On Key Largo and at Card's Point, I found it nesting in epiphytic Tillandsias in mangrove thickets: at Miami I saw a fine colony nesting under a piece of loose bark on the trunk of a living tree.

VI. *Novogranadensis* Group

52. *Camponotus bruesi* sp. nov.

Worker major. Length, about 6 mm.

Head rather small, subrectangular, a little broader behind than in front, with feebly excised posterior border and slightly convex sides; anterior corners lobular and rounded, slightly reflected. In profile the head is obliquely truncated anteriorly, but the truncated surface has rounded lateral borders. Eyes rather large, slightly convex. Clypeus flattened, about one-third again as long

as broad, about one-half as broad behind as in front; its anterior border broadly rounded and entire, its lateral and posterior borders also rounded, the former diverging anteriorly. A raised, longitudinal line, most distinct on the posterior portion of the clypeus, represents the carina. Frontal area present only as a minute triangular impression. Frontal carinae lyrate; frontal groove distinct. Antennal scapes slender and not flattened at the base, enlarged towards their tips, which surpass by about one-sixth their length the posterior corners of the head. Thorax rather long, narrower than the head, broadest in front and gradually narrowed behind, but with the pleuræ scarcely compressed; in profile rather low, arched, with pronotum somewhat flattened, the mesonotum convex and the epinotum depressed and sloping, without distinct basal and declivous surfaces. Petiole high and cuneate in profile, with blunt border; seen from behind, the scale is narrow at the base, gradually expanding above, with broadly rounded, entire border. Gaster of the usual shape. Legs rather long and slender.

Mandibles and head opaque, the former very finely and indistinctly striated, sparsely punctate; teeth smooth and shining. Clypeus and cheeks irregularly rugose and coarsely punctate, remainder of head densely and uniformly punctate. Thorax somewhat shining, densely, but somewhat more superficially punctate than the head; gaster and legs still more shining, transversely shagreened; the upper surface of the gaster also with scattered, piligerous punctures.

Hairs delicate, white, erect; abundant on the thorax, petiole and gaster. Head with a few long hairs on the vertex, sides with short, erect hairs; those on the truncated surface still shorter and appressed. Scapes and legs with short, stiff, oblique hairs, less abundant on the femora, which have a row of longer, erect hairs on their flexor surfaces. Tibiæ without bristles on their flexor surfaces. Pubescence lacking.

Black; mandibles, cheeks, posterior end of clypeus, anterior portion of front, antennæ and tarsi, except the first joint, deep red. Posterior edges of gastric segments brownish.

Worker minor. Length, 4-5 mm.

Differing from the worker major only in the head, which is smaller, not broader than the prothorax, somewhat longer than broad, narrower in front than behind, with straight sides and posterior border. It is not obliquely truncated in front, but has a rather convex, sharply carinate clypeus, with broadly rounded, entire anterior border. Eyes more convex, antennal scapes reaching about half their length beyond the posterior corners of the head. The whole head is uniformly and densely punctate and a little more shining than in the worker major. Cheeks and clypeus with a few scattered foveolæ. Hairs on the dorsal surface of the head more abundant, those on the cheeks more delicate than in the worker major. Mandibles, antennæ and tarsi, except the first joint, deep red; remainder of the body black.

Described from a single worker major and a number of minor workers taken by myself on the trunk of a small desert *Acacia* at Fort Davis, Texas. There are also in my collection three minor workers taken by Mr. C. H. T. Townsend at Cerro Chilicote, Chihuahua, Mexico, and

three minor workers collected by Mr. J. F. McClendon at Guadalajara, Mexico.

This species seems to be very closely related to *C. frontalis* Pergande from Tepic, Mexico, but it is decidedly smaller, the clypeus is much broader and more rounded in front, the scapes have no erect hairs and the gaster lacks bluish reflections. Pergande gives no description of the thoracic structure. Another allied Mexican species is *C. andrei* Forel, but this has a more nearly rectangular clypeus, the head is not obliquely truncated in front and is neither rugose nor red in this region. *C. bruesi* shows an unmistakable approach to the species of the subgenus *Colobopsis* through forms like *C. abscisus* Forel of Guatemala and *C. ulcerosus* described below.

VII. *Ulcerosus* Group

53. *Camponotus ulcerosus* sp. nov.

Worker major. Length, 6.5 mm.

Head rather large, subrectangular, a little longer than broad, as broad in front as behind, with nearly straight posterior and very feebly concave, subparallel lateral borders; posterior corners rather angular, anterior corners produced forward as rounded lobes beyond the anterior border of the clypeus and the closed mandibles. In profile the head is high and convex behind, obliquely truncated in front, with flattened gula. The truncated surface is bordered on each side by a coarsely crenate ridge, which runs from the outer edge of the lobe-like anterior corner to a little in front of the eye, where it turns inward and subsides before reaching the frontal carina. This ridge forms the outer boundary of an elongated, irregular and rather deep impression resembling the scar of an ulcer. Eyes rather small, feebly convex. Mandibles apparently 4-toothed, flattened; their outer borders sinuate towards the base. Clypeus flat, ecarinate, trapezoidal, one and one-half times as long as broad, with straight, somewhat crenate anterior border, about twice as long as the posterior border, which is also straight; the sides slightly curved outward and diverging anteriorly. Frontal area distinct, triangular, as long as broad. Frontal carinae far apart, more approximated and lyrate in front, parallel behind, forming the inner boundaries of rather deep scrobes for the bases of the antennal scapes. Frontal groove distinct. Antennal scapes much curved at the base, slender, but distinctly flattened, enlarged towards their tips, which reach nearly to the posterior corners of the head. Thorax decidedly narrower than the head, rather long, gradually narrowed posteriorly, but with distinctly convex pleurae; in profile, the dorsum is rather flat, feebly arcuate; epinotum with subequal base and declivity, both slightly concave and meeting at a rounded angle. Petiole high, cuneate in profile, with thick base and narrower summit, and both anterior and posterior surfaces flattened; border obtuse; from behind, the scale is narrow at the base, expanding above, with broadly rounded, entire upper margin. Gaster of the usual shape. Legs slender.

Head opaque; occiput and posterior angles shining; the truncated anterior portion, including the mandibles, clypeus, the portions of the cheeks within the ridges and the anterior portion of the front, uneven and irregularly rugose; remainder of the head covered with dense, uniform punctures and more scattered and rather deep foveolæ, which are slightly elongated on the cheeks outside the ridges. Thorax, petiole, gaster and legs densely punctate, more shining than the anterior portion of the head, less so than its posterior corners. In addition to the dense punctures, the surfaces of these parts are covered with coarse, scattered piligerous punctures.

Hairs glistening white, erect, abundant; longest on the gaster, petiole and thorax, shorter on the head; blunt on the cheeks and sides of the head. Antennæ with short, delicate, erect hairs on the anterior surfaces and tips of the scapes. Hairs on legs sparse, rather long and oblique or suberect. Tibiæ without bristles on their flexor surfaces. Pubescence apparently lacking.

Black; mandibles, clypeus, front and cheeks to a little outside the ridges which bound the truncated surface, yellowish brown; posterior edges of gastric segments, antennæ and tarsi, except the first joint, dark brown, antennal scapes somewhat paler and more reddish towards their bases.

Described from a single specimen taken by Mr. C. Schaeffer at Palmerlee, Huachuca Mts., Arizona.

This remarkable species differs from all our other North American *Camponoti* in the peculiar structure of the head, which shows a decided resemblance to certain species of *Colobopsis* and furnishes additional proof, if it were needed, that this group cannot be defined with sufficient precision to constitute a genus. Except in the structure of the head, *C. ulcerosus* is very closely related to *C. bruesi* and *C. frontalis* Pergande. Indeed, the worker minor of *ulcerosus* must be almost indistinguishable from that of *bruesi*, although it probably differs in having a higher and more angular epinotum.⁷

B. SUBGENUS COLOBOPSIS MAYR

As I have given a full description of our North American species of this peculiar subgenus and of their habits in a paper published several years ago,⁸ I may here confine myself merely to enumerating the different forms with their synonymy and habitats and to describing a new variety which has come to light more recently.

54. *Camponotus (Colobopsis) abditus* Forel var. *etiolatus* Wheeler

WHEELER, Bull. Amer. Mus. Nat. Hist., XX, p. 150, ♀ ♀ ♂, 1904.

⁷ I recently found two colonies of *C. ulcerosus* in the type locality (Miller and Carr Canyons, Huachuca Mts.). These colonies were nesting in the ground under large stones at altitudes of 5500 and 6000 ft., respectively. The minor worker, which will be described on another occasion, is, as I surmised, very much like that of *C. bruesi*.

⁸ "The American Ants of the Subgenus *Colobopsis*," Bull. Amer. Mus. Nat. Hist., XX, pp. 139-158, 7 figs., 1904.

Texas: Austin, in galls of *Holcaspis cinerosa* on *Quercus virginiana* (Wheeler); Victoria and Jackson County, in twigs of *Hicoria pecan* (J. D. Mitchell).

55. *C. (C.) impressus* Roger

Colobopsis impressa ROGER, Berl. Ent. Zeitg., p. 160, ♂, 1863; MAYR, Verhandl. Zool. bot. Ges. Wien, p. 423, 424, ♂, 1886.

Camponotus impressus DALLA TORRE, Catalog. Hymen., VII, p. 235, 1893.

Camponotus (Colobopsis) impressus EMERY, Ann. Mus. Civ. Genova, XXVII, p. 517, 1889; Zool. Jahrb. Abth. f. Syst., VII, p. 681, ♂, 1893; WHEELER, Bull. Amer. Mus. Nat. Hist., XX, p. 144, ♂ ♀, 1904.

Georgia: (Mayr).

Florida: Lake Worth (Jerome Schmitt); Belleair (Mrs. A. T. Slosson).

Texas: Dallas (Schwarz and Pratt).

Indian Territory: Okmulgee (J. D. Mitchell).

56. *C. (C.) pylartes* Wheeler

WHEELER, Bull. Amer. Mus. Nat. Hist., XX, p. 147, ♂ ♀, 1904.

Texas: Delvalle, in twigs of *Hicoria myristicifolia* (Wheeler); Victoria (W. D. Hunter); Longview and Liberty (S. S. Tucker).

Louisiana: Shreveport, in spine of *Gleditsia aquatica* (W. D. Hunter).

57. *C. (C.) pylartes* Wheeler var. *hunteri* var. nov.

Both the major and minor workers of this form differ from the corresponding phases of the typical *pylartes* in color, the head, thorax, petiole, antennae, legs and two basal gastric segments being yellow, the head of a little deeper and more reddish, the base of the gaster of a paler tint than the thorax. Tips of the antennal funiculi black. First and second gastric segments with a narrow, transverse, fuscous band near the posterior edge; remaining gastric segments black. In some specimens, the base of the third segment is also pale yellow.

Described from numerous specimens taken by Mr. J. S. Mitchell in twigs of pecan (*Hicoria pecan*) at Victoria, Texas, and sent me by Dr. W. D. Hunter.

POSTSCRIPT

While this paper has been going through the press, I have had an opportunity to collect additional material of *Camponotus* in southern Arizona and California and have succeeded in finding several new forms belonging to the *maculatus* group. Descriptions of these, with the exception of the following interesting subspecies, must be reserved for another occasion.

58. *Camponotus maculatus dumetorum* supsp. nov.

Worker major. Length, 10–13 mm.; head, 3.3 x 3 mm.; scape, 2.5 mm.; hind tibia, 3 mm.

Combining characters of *maccooki* and the typical *vicinus*. Antennal scape not only flattened at the base but dilated to form a lobule which is even larger than that of *maccooki* and often obtusely angular. Body coarsely shagreened; head and thorax subopaque, gaster slightly shining. Clypeus with several large, elongate, piligerous foveolæ; cheeks with more numerous and smaller, elongate foveolæ; remainder of head feebly punctate; frontal region with a few deep, piligerous punctures. Hairs and pubescence as in the typical *vicinus*, yellow, the former absent on the cheeks, erect and abundant on the dorsal and gular surfaces of the head, thoracic dorsum, petiolar border, gaster and flexor surfaces of the femora. Pubescence long but sparse, conspicuous on the head, pleuræ, legs and gaster. Head, mandibles, scapes and gaster black; funiculi, legs, thorax, petiole and extreme base of first gastric segment dull brown.

Worker minor. Length, 6–9 mm.

Resembling the worker major, but with the usual differences in the shape of the head, which is often more or less brown like the thorax, especially in front. The lobule at the base of the antennal scape is very large and conspicuous and more angular, so that the scape at this point may be broader than at the tip.

Male. Length, 10–11 mm.

Resembling the male of *vicinus*, but the head is proportionally shorter and broader, the cheeks are more convex and the scapes are flattened and lobulate at the base. The whole head, especially its sides and gular surface, is conspicuously hairy. Pleuræ, gaster and legs also with numerous, but less conspicuous, erect, tawny yellow hairs. Head and thorax opaque, gaster and legs more shining, but the whole surface densely shagreened. Body black; funiculi and tarsi brown; wings suffused with yellow, with yellow veins and stigma.

Described from numerous specimens taken from many colonies in the dry foot-hills of the San Gabriel Range near Pasadena and Claremont, California, up to an altitude of 2,000 feet.

This ant appears to be the dominant insect of the chaparral. It nests in the ground among the bushes, forming flat craters varying from a few inches to a foot in diameter, with a round or, more frequently, elongate entrance. It does not go abroad in the day time, at least during the dry season. The number of its nests in the chaparral is surprising, but it is difficult to study these, except in places where the brush has been burned over or where it has been cleared away to leave fire guards. The workers probably derive their sustenance from the aphids and coccids on the scrub-oaks (*Quercus dumosa*) and other bushes that compose the chaparral.